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(1968 INVENTORY)

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STATISTICAL SUMMARY • 1968 INVENTORY

MUNICIPAL WASTE FACILITIES

IN THE UNITED STATES

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STATISTICAL SUMMARY
1968 INVENTORY

MUNICIPAL WASTE FACILITIES

IN THE UNITED STATES

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Federal Water Quality Administration
Division of Technical Support
Technical Data and Information Branch

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INTRODUCTION

This publication presents a summary and analysis of data on sewage disposal and treatment facilities in the United States and territories. Detailed information on individual facilities will be published in the 1968 Inventory of Municipal Waste Facilities (1). The data reflect the status, characteristics and types of disposal and treatment facilities in place on January 1, 1968. The inventory is the fifth to be taken on a national basis. The previous four, in 1940 (2), 1945 (3), 1957 (4) and 1962 (5), were conducted and published by the Public Health Service.

Certain data from the statistical summaries of the previous inventories have been included in this publication to allow comparison with the 1968 inventory and to provide a measure of progress in the control and disposal of municipal wastes. Analyses of the data and of trends in the methods of collection, treatment and disposal of the wastes are included in the text.

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I

BASIC DATA

General

The data summarized herein were collected between *January 1, 1968* and *July 14, 1969*, but are intended to reflect municipal sewage collection, treatment and disposal facilities existing as of January 1, 1968, together with any additional abatement needs. Flow rates and effluent data are supposed to show averages for the year 1967. Great care and effort have been expended to make the data as accurate and complete as possible; however, the user is cautioned to exercise judgement in making comparisons with earlier data. Shortages of manpower or other resources in some of the State agencies restricted to varying extents the effort which could be devoted to this project; hence, the differences between this and the 1962 inventory may not present a totally accurate picture of progress over the six year period. This could be especially true for the States of Pennsylvania, Florida and Tennessee for the results of final review by the States had not been received by the cut-off date for analysis and aggregation of the data.

It should be noted that some of the 1962 data included in this summary reflect correction of errors discovered after publication of the 1962 inventory.

All data are now stored on magnetic tape and as changes occur, errors detected, and new plants come into existence, this information can be changed or added to effect a perpetual inventory.

Definitions

For purposes of this summary, the key words "community" and "facility" are defined as follows:

A *community* is defined as any grouping of houses where there is a permanent resident population engaged in a normal domestic pattern of living. It is a named place to which a census or census-type population can be assigned. (Note: where a U.S. Census figure for 1960 was not available, data were taken from the 1961 Rand-McNally Atlas.) It may or may not be incorporated. It may or may not have its own disposal facility; or it may have more than one. In data tables relating to communities, the *number* of communities should be considered a minimum, because at least two States did not return all forms relating to communities which were served by some other disposal facility even though the populations served are properly reflected by the serving facility.

A *facility* is defined as a treatment plant or, in the case of raw discharge, the collection system. There may be more than one facility in a community or one facility may serve several communities. In the tabulations, the population served is associated with the serving facility only.

Grouping of Summary Data by Population and Drainage Basins

Population Size Groups

Each of the reports was placed in one of the 10 groups shown below according to the 1960 census population of the *community* in which the facility was located.

Group	*Population Range*
1	Under 500
2	500-1,000
3	1,000-5,000
4	5,000-10,000
5	10,000-25,000
6	25,000-50,000
7	50,000-100,000
8	100,000-250,000
9	250,000-500,000
0	500,000 and over

Facilities located in sanitary districts for which a census could not be determined were grouped according to the population served. Such a report is not counted as a community, but is counted as a facility. For example, Community A in Group 4 has 6,500 persons served by Community B in Group 7. Community A is counted as a community in Group 4, but the 6,500 persons served are counted in Group 7, where the serving facility is listed. Conversely, Facility B, located in Community B which falls in Group 3, serves 3,500 persons of Community B, but also 15,000 additional people in three other communities. The report is classified in Group 3, the size of the community in which it is located, but all 18,500 persons are counted in here as being served by the facility. The three other communities are counted as communities in their respective groups, but the population served is not counted. Thus, it is theoretically possible in a table for a count of a community to appear with no associated population served. It is also possible for a population served to appear with no community count, if the serving facility happens to be a sanitary district.

Drainage Basins

Following the Water Pollution Control Act of 1948, the Continental United States was divided into 15 major drainage basins as shown in Figure 1.

Alaska, Hawaii, Puerto Rico and the Virgin Islands have each been assigned arbitrarily as a major basin. The data in this publication have been summarized by these major basins only, although they have been tabulated by some 250 minor basins. These have been furnished to cooperating State agencies and are on file in the Washington office of FWQA. There has been one major change in major basin boundaries since the 1962 Statistical Summary which must be kept in mind if comparisons are made between the two periods. The Lower Hudson River—Metropolitan New York and the New Jersey Coast Minor basins have been shifted out of the North Atlantic Major Basin into the Northeast Major Basin.

Summary Data

The basic data in this summary are presented in Tables 1 through 9. Population served figures have not been rounded because of inherent difficulties in balancing between tables. However, *no fictitious precision is imputed to these data since they are, at best, only estimates.* Percentage tables, on the other hand, may not add because of rounding.

National summaries are given in Tables 1, 2, and 3 for sewer systems, sewage treatment and disposal. Details by States, population size groups, and major drainage basins are shown in Tables 5 through 9. The data in Tables 1, 2, and 3 are totals of later tables and are brought together for a quick summary of nationwide conditions.

Tables 2 and 3 are additive, as are the detailed tables from which they are taken. If more than one type of settling tank was present in a primary plant, the plant was classified as of the highest type. The general order was: Imhoff tanks; mechanically cleaned tanks; plain hopper-bottom tanks; settling tanks with no details; and, septic tanks. Similarly, when more than one secondary process was present, the classification was in this order: extended aeration; activated sludge; high rate trickling filters; standard rate filters; intermittent sand filters; stabilization ponds; and, application to land.

Data for selected intermediate and secondary treatment processes are given in Table 8. These are not additive, since a facility might use more than one. For instance, a trickling filter might be followed by a stabilization pond. In the plant classification, this would be considered as a trickling filter and counted once, but in Table 8, concerned with only the presence of processes, it is considered in both places and counted twice.

Table 4 shows the population served by the various population size groupings. This table is especially made to show the extent to which communities dispose of their wastes through the facilities of others. Populations served by another facility are counted throughout the tabulations with the serving facility. Table 4 shows there were over 30 million persons so served. For instance, there were 693,874 persons served by facilities in communities of less than 500 census population. In addition, there were 32,215 persons in places of this size group served by facilities of some other place of any size group. It happened that 1,835 were in the same size, under 500. Thus, it can be determined that in places under 500, there were 724,254 of the population connected to sewers, served by their own or other facilities. This

type of adjustment was not made on State or basin tables because a shift could occur only when persons in one State or basin were served by facilities in another State or basin. Hence, with these exceptions, the population served would be the same as the population connected to sewers.

II

DATA ANALYSIS

General

For January 1, 1968, the Census Bureau estimated there were 197 million civilian residents in the United States. From the data in this summary, 70 percent of the total population were connected to sewage systems for waterborne waste disposal. In 1962, the figure was 63 percent of the total population. Considering the increase in population, from 183 million to 197 million, or 8 percent, the rate of connecting the population to sewers, from 118 million to 140 million or 18 percent, is between 9 and 10 percent above the population growth. That is, in the six-year interval, sewage disposal construction has kept ahead of the population growth by that amount. There are 12,911 sewered communities in the 1968 inventory or 1,491 more than six years earlier. It is not known exactly how many of the nearly 13,000 are "new" in the sense that they have developed sewer systems since 1962, but it may be assumed that most, if not all, of the net increase fall into this category. This assumption is based on the fact that two States did not return all records for those communities served by some other facility, and there are other known consolidations or annexations which would have reduced the original 1962 figure had there been *no* new communities added. The reader is again reminded that numbers of communities where they appear should be considered minimum.

Of the 12,911 communities, 88.5 percent discharged treated sewage, 11.0 percent discharged all raw sewage and less than 1.0 percent discharged both treated and untreated sewage. Some type of treatment was provided for 93.2 percent of the total population connected to sewers. This figure is 5.6 percentage points above that for 1962. There was a total of 12,565 treatment plants, an increase of 34 percent over the last inventory. Of these, 79.8 percent were secondary and served 65.7 percent of the population receiving treatment. Table 21 shows that the number of secondary plants increased by 51.1 percent and the population served by this degree of treatment increased 40.0 percent since 1962.

States

Note: For convenience the word *States* in this summary includes the District of Columbia, Puerto Rico, and the Virgin Islands—which are shown in alphabetical sequence.

Table 10 shows by States the percentage of the 1960 census of the sewered communities in the inventory which is connected to sewers and the percentages of the population served which discharge treated and untreated sewage. The percentage of the census population connected to sewers is not too meaningful because of the lapse of eight years reflecting population growth in the numerator and a theoretical no change in the denominator. Thus, all but 12 States show more than 100 percent of the census population connected to sewers—as much as 305 percent in Nevada. Of the 12 under 100 percent, eight showed some increase over 1962, but four did not—Massachusetts, Minnesota, Rhode Island and Vermont. For Massachusetts, a duplicate entry of 713,000 was found in the 1962 entry for minor treatment. Correction for this brings the 1962 percentage sewered down from 97.4 to 81.5. The 1968 figure is still two percentage points below the adjusted figure and the decline is attributed to loss of population in some of the industrial areas. (Minnesota reported for the first time some communities served by others which increased the total census population, but unfortunately, the serving facility populations were not increased to show proportionate changes in these figures. It is assumed the omissions in earlier inventories were oversights.) In addition, many new communities were added, with the total census population being indicated as served. Both these factors increased the census base, but the served population was not increased enough to show a percentage increase. Rhode Island's decline is attributed to losses of population served in the East Providence, Providence, and Newport areas which more than offset gains elsewhere. In Vermont many new communities were added, but only a fraction of the census population was connected to sewers at the time of the inventory.

In 34 States, more than 90 percent of the population connected to sewers were served by some kind of treatment—14 of these were 99 percent or better. Twelve others were between 50 and 90 percent, leaving five under 50 percent. The Virgin Islands was the only entry reporting no treatment. See Footnote 1 to Table 10 for explanation of lack of entries for Maryland and the District of Columbia.

Geographical Areas

Census Bureau geographical area grouping has been used in Table 11 to analyze general sewage work data. The States included in each group are listed in the footnotes, and have been arranged so that data can be compared with those of other fields pertinent to special problems analyses. As might be expected, the Middle Atlantic States have the largest population connected to sewers, followed by the East North Central Area. Continuing progress in sewage plant construction is indicated by the fact that in only three areas, New England, East South Central, and West South Central, does the percent of the sewer-connected population fall below 90 percent provided with treatment facilities. This indicates still further progress, considering that in 1962 seven of the 10 areas fell below 90 percent. Only in the combined noncontiguous areas of Alaska, Hawaii, and Puerto Rico, does the percent of the connected population receiving treatment fall below 70 percent.

Drainage Basins

Table 12 summarizes percentage data for sewer systems and raw and treated discharge by major drainage basins. There has been no significant change in community-totals distribution among the basins since the last inventory. The Upper Mississippi Basin, with 15.2 percent, has the largest percentage of communities, with the Ohio River Basin second with 12.2 percent. The continental basin with the smallest percentage of communities is the Great Basin with 1.1 percent. The Northeast Basin contains the greatest sewer-connected population (18.6 percent of the U.S. total), while Alaska, Hawaii, and Puerto Rico, with 0.9 percent of the communities combined, have the least population connected.

There are noticeable changes in the percent of connected population discharging treated and raw sewage as well as in the percent of total communities discharging treated and raw sewage. In every basin the percentage of connected population discharging treated sewage has increased in the last six years. The greatest change occurred in the Great Basin—23.9 percentage points. Of more importance, perhaps, was the 21.8 percentage point increase in the Missouri Basin because of the larger population involved—6.8 million compared to 1.3 million. In the Missouri Basin there was also a 7.7 percentage point increase in the proportion of communities discharging treated sewage, and a 4.2 percentage increase in the Great Basin.

The *Western Gulf*, with 5.9 percent of the U.S. sewered population, reported only one community out of 640 as discharging raw sewage. Contrastingly, considering the continental basins, the Southwest—Lower Mississippi River Basin had 79.2 percent of the connected population receiving treatment from 94.6 percent of the communities having such disposal facilities.

Population

For administrative reasons, population size groupings in this summary have been expanded from eight to 10 to break out the larger cities. Therefore, to make comparisons with earlier inventories the three highest groups need to be combined to read "100,000 and over". Table 13 brings together percentage distributions by population size groups relating to: (1) the number of communities; (2) the census population of those communities; (3) the population connected to sewers in the communities of the size shown without regard to the disposal means; (4) the population served by facilities in the group size shown without regard to the size group of those served; (5) the population served by raw discharge disposals in the size group shown; (6) the population served by treatment facilities located in the size group shown; and, (7) the number of those facilities.

Disposal facilities in communities of 100,000 or more served 52.9 percent of the population. This is 2.8 percentage points below that of six years ago. The relative decrease is reflected in the increase in number of communities and plants in the smaller categories, since 89 percent of the increase in number of communities is in the group under 5,000.

It will be noted that over half (51.8 percent) of the raw discharge is contributed by the three largest population groups. This is traceable to 27 of

the 1558 raw discharges. The 51.8 percent is 6.4 percentage points over the same figure for 1962, which also supports the indication of treatment plants being built in the smaller places. A decline of 4.2 percentage points in the proportion of treated sewage in these groups also supports the position.

Table 14 presents the percentage of census population connected to sewers and a percentage breakdown of that population discharging raw or treated waste for 1968. All size groups have sewered populations in excess of the census figure, with the total being 13 percent above the census. This mainly reflects growth since 1960 (the national growth was 11 percent), but part is due to connected populations outside the census-defined limits. The percentage of the population discharging raw sewage has reduced sharply over the last three inventories—22 percent in 1957, 12 percent in 1962, and now, just under seven percent. With complementary increases on the treated side of the ten population groups, only three have less than 90 percent treated—lowest being 88.1. Two groups are 95 percent or better, with the national average being 93.2 percent.

Comparison with Prior Data

Tables 15 through 19 bring together data that may be compared with earlier summaries beginning with 1940. In the past 28 years, the number of communities with sewers has increased from 8,500 to 12,900 (Table 15), although the latter number is a minimum for reasons previously stated. Sewered communities without treatment have dropped from a high of 3,800 in 1948 to 1,489 twenty years later. It is not known for certain, but a spot check of the data would indicate that probably as many as 100 of the 1,489 were brought into the inventory for the first time as being sewered since 1962. Some data revealed that treatment plants were under construction. The population discharging raw sewage was 28-30 million during the 1940 decade and now has dropped to less than 10 million. The treated sewage population on the other hand has more than tripled from 40 million to 131 million in the same time span. The percentage of the sewered population using treatment facilities increased 58 percent to 93 percent. Another measurement would be to relate the treated population to the total U.S. population. In 1940, less than one person in three was served by a treatment plant. In 1968, two persons of three were so served.

Stream Loadings

Table 16 shows the population equivalent of the Biological Oxygen Demand (BOD) load of waste water discharged to water courses. By relating the population equivalent of the sewage at the plant to the strength of the discharge it is possible to determine the percent reduction of BOD for each treatment type. These data were available for 43 percent of the plants serving 46 percent of the population connected to treatment facilities. The percentages so derived are shown in the first column. When applied to the total treated population, the net burden to the streams from plants could be determined. Added to this is the untreated sewage. The population so discharging was increased by 25 percent to show the population equivalent of this discharge. This increase is accounted for by industrial and trade

wastes. (Interestingly enough, this figure was between 30 and 37 percent for wastes going to plants.) The net load to streams is equal to the raw sewage of 54,323,000 persons. Despite the large increase in population, this is the lowest figure since data were available for 1940, and shows the effect of increased plant building and the emphasis on secondary treatment. Although there was a 42 percent increase since 1968 in the population utilizing secondary treatment, there was only a seven percent increase in secondary contribution to stream loadings. All other categories were down.

Development of Community Sewer Systems

In a book published in 1938, "Modern Sewage Disposal", C.G. Hyde (6) gave an interesting and comprehensive review of the development of sewage systems and treatment processes in the United States from the mid-19th century to the early 1930's. The data for 1860 through 1935 in Table 17 are adapted from that paper. With the inclusion of 1968 data, there is a 108-year record of the expansion in water-borne waste disposal. In every period except two, 1935-40 and 1945-48, the sewered population has increased faster than the national population. Since 1948 this rate has been nine, 10, and 11 percent greater than the census.

Since 1940 the census population has increased 50 percent while the sewered population has practically doubled. Between 1940 and 1949 the sewered population hovered between 53 and 54 percent. In 1957 the figure was 57 percent and in 1962, 65 percent. As of 1968, 70 percent of the population was connected to sewers. This percentage will go up in future years, but not reach 100 since it is estimated that there will be 50 million persons who for economic, engineering or geographic reasons are considered "nonsewerable".

Table 18 indicates that nearly three-fourths of the communities with sewers had census populations under 5,000 but these included only 11.5 percent of the total population connected to sewers. Increases in the relative percentages of communities in the lower population groups reflect the addition of the 1,490 places added to the inventory since 1962, and their contributions to the total populations. Cities of 100,000 or more make up less than one percent of the communities, but hold 43.0 percent of the persons involved.

Sanitary Districts and Communities Serving Others

Table 19 was developed from Table 4 and indicates the percent of the sewered population that was served by other than their own facilities and the percentage of the population served which was contributed by others. Table 4 shows that 30.3 million persons utilized these "other" facilities or 21.6 percent of the total connected population. The percentages have varied between 20.5 and 22.7 in the three inventories since 1957, but the number of persons has increased 51 percent over that time.

The percentages of both "served by" and "serving others" declined in all population groups under 10,000 again reflecting the construction of new plants since 1957. In fact, percentages declined in all population groups under 100,000 except that between 10,000 and 25,000 and this increase was

slight. For comparison, the groups of 100,000 and over combined were equal or almost unchanged since 1957. For 1968, the large cities over 500,000 had one person in five served by some other facility, however, nearly half (44 percent) of persons served by those cities were "outsiders".

Type of Sewers

Table 20 gives the percentage of communities having separate, combined, or both types of sewers within each of the population size groups. The national average is that 85.2 percent of the 12,111 communities which replied had separate sanitary and storm sewers. This figure is 2.7 percentage points higher than in 1962. All population size groups below 100,000 increased over six years earlier. The three largest groups when combined were down less than half a point. The extent of use of separate sewers varies inversely with the size of community. For places of less than 500 population, the percentage is 95.5 and decreases with each larger place group to 50.7 percent for those over 100,000. The reverse situation is true for combined sewers and for places that had both separate and combined types. These percentages now are 9.7 and 5.1 respectively.

Reference to Tables 1 and 5 will show that there was an increase of 1,000 in the number of communities using separate sewers, and no change in the number of communities using both separate and combined sewers. These tables also show that there was a decrease of 232 in the number of places reporting the use of combined sewers. At first glance, this might be taken as evidence of activity toward the physical separation of sanitary and storm wastes. Such a conclusion would be misleading. Between the two inventory periods of 1962 and 1968, this subject was questioned, the data were re-evaluated in the field offices, and as a result, many erroneous reports were corrected. It is possible that the current figure of 1,173 is still overstated. On the other hand, one must consider those communities for which the status was not given.

In 1962, 414 communities did not have a status given. In 1968, this number was 800. A detailed examination of each of these 800 showed that 570 were communities which were entered in the inventory for the first time. Of this latter number, 338 were in four States—Illinois, Michigan, Nebraska and Pennsylvania—and the remainder were scattered through 31 States. Eighteen States reported none. Significantly, all but 28 of the 570 communities were under 10,000 population. If it may be presumed that the 570 had sewers installed since 1962, it might further be assumed that in light of current policy and general practice, these new sewers in such sized places would fall into the "separate" category.

Treatment

Table 21 shows a comparison of the numbers of treatment plants and the populations served for the seven inventories since 1940 and the percentage relationship of 1968 to each of the earlier from 1945. Except for an increase of 10 in the minor treatment category, all plants of degree less than secondary have consistently declined since 1945. Secondary plants in 1968 were

more than 50 percent greater in number than 1962. While the number of primary plants have declined in number since 1949, the population served by them has increased each period. Populations served by secondary treatment, at 85.6 million, is 40 percent above 1962, double that of 1957 and nearly quadruple that of 1945.

Percentage distributions of treatment plants and populations served by size groups and drainage basins are given in Tables 22 and 23 respectively. There has been a continued accentuation in the shift in proportions from primary to secondary even though there was an absolute increase in populations served by primary in all groups. Considering the continental basins, the New England area had the highest relative proportion of plants in the primary category—48.0 percent—as well as the highest number—445. The second highest percentage was Western Great Lakes with 34.2 percent of the plants, but over half (51.7 percent) of the population is served by primary processes. The Pacific Northwest also showed half (50.5 percent) of its population as utilizing primary treatment. With 80 percent of the plants in the United States being of the secondary degree, and 66 percent of the population served, the lowest percentage of plants in this category was 49.0 in the Northeast followed by Western Great Lakes and Pacific Northwest. All percentages are more closely grouped around the national averages than in earlier years.

Primary Treatment

Table 24 shows the number of primary plants and the population served by them in the various types of processes. Altogether there were 2,384 such plants serving 36.9 million persons. Eight States, serving over one million each, accounted for 27.8 million or 70 percent of all persons connected to primary treatment. Of the 27.8 million, 22.2 million of these were in places of 100,000 population or greater. The most numerous type was mechanically cleaned tanks which displaced Imhoff tanks as the most common in 1957 and 1962. This type of treatment served 31.3 million persons or 85 percent of total primary.

Table 25 shows the percentage distribution by major drainage basins. The percentage of population served by Imhoff tanks is deceptively high in the Lake Erie, Western Gulf and Great Basins because the population bases are small, as Table 6 will show. In terms of numbers this method is popular in the Northeast, Southeast and Ohio River Basins.

Primary plants with mechanically cleaned tanks served 84.7 percent of the total population served by primary plants, with nine of the 15 continental basins showing individual percentages above this figure. The decline in proportion from 1962 shown for the Northeast Basin is brought about in part, at least, by a shift into the basin boundaries of the New York Metropolitan and Jersey Shores areas.

Intermediate and Secondary Treatment

There are 75 intermediate and 9,951 secondary plants in the United States serving 5.9 and 85.6 million persons respectively. Intermediate treatment is

defined as chemical treatment of sewage with sedimentation in the absence of any secondary process. The number of such plants declined from 85 in 1962 and the population served is down from 7.4 million.

In the secondary category, activated sludge plants went from 800 in 1962 to 1,309 in 1968, an increase of 64 percent, while the population served went from 33.3 million to 38.6 million or 16 percent. Of the 509 increase in number of plants, 346 or 68 percent were in places under 5,000 population. Extended aeration plants went from 154 in 1962 to 801 in 1968 with the population served rising from 409 thousand to 2.7 million. Standard rate trickling filters declined by 111 plants with a very slight increase in population while high rate filters increased by 393 plants with a 43 percent increase to 16.4 million.

Stabilization ponds as the principal means of secondary treatment numbered 3,457 in 1968, a 156 percent increase over the 1,347 in 1962. The population went from 2.2 million to 6.1 million in that period, almost threefold. While this type of treatment is more extensively used in smaller communities, some appear in all population size groups. Those in places over 25,000 are installations that serve subdivisions not connected to other plants. Table 26 presents a percentage distribution of plants and population served for population size groups. Table 27 presents the same information on distribution for major drainage basins.

With stabilization ponds being the most numerous type of secondary plants—one out of three—some geographical pattern might be expected. An examination of Table 27 shows that this type of plant dominates the Southeast Basin—and all the basins west of the Mississippi except the Great Basin, and there it is close. In none of the areas, however, does this type of treatment have the highest proportion of the population served. That characteristic goes to the activated sludge process in 10 of the 15 continental basins—all the basins east of the Mississippi except the Southeast, the Missouri, Colorado and California. The remaining five basins are dominated by trickling filters.

Table 28 compares usage of selected secondary processes with earlier inventories beginning in 1940. There was an increase in the number of all processes except standard rate trickling filters and intermittent sand filters. Stabilization ponds had the largest number, 3,837, which was more than double the 1962 figure, but the sharpest increase was extended aeration which, at 826, is more than five times the number six years ago. Populations served increased for all processes except standard rate filters.

Sludge Digestion

Units for the digestion of sludge were classified under four headings: septic tanks, Imhoff tanks, separate, and stage digestion (Table 9). Septic tanks were reported for 587 plants which is approximately 300 less than 1962. Imhoff tanks were reported 500 less than six years ago—2,364. Stage digestion increased from 630 to 754 while separate digestion went from 3,077 to 4,230, an increase of 37 percent.

Sludge Dewatering

Sludge drying beds were reported for 6,046 plants or about half the total 12,565 plants. Nearly 4,500 plants reported not having sludge dewatering or other organized drying methods. This number very nearly approximates the sum of septic tanks, Imhoff tanks and stabilization ponds as sewage treatment methods. A total of 191 reported use of sludge lagoons and 656 indicated mechanical devices were employed.

Chlorination

In 1968 there were 5,107 plants servicing almost 81 million persons, which had incorporated chlorination facilities (Table 9). This represents 40.6 percent of all plants and 61.9 percent of all persons served by treatment, and also a 48 and 47 percent increase respectively over 1962 in the number of plants and population. Pennsylvania had the largest number, but Alaska, Nebraska and the Virgin Islands reported none.

Grit Removal

Grit removal processes were reported in use by 3,343 plants serving 98 million people. This represents slightly more than one fourth of the plants but three-fourths of the persons connected to plants (Table 9). Table 29 shows that the percentage of plants removing grit increases as the size of the community; even so, the relative proportion of the plants using these devices in the large cities has declined since 1962.

Grease Removal

Grease removal was reported for 138 plants serving 12.1 million persons (Table 9). These figures represent only a slight increase over the 1962 figures of 113 plants serving 11.0 million people.

REFERENCES

(1) 1968 Inventory of Municipal Waste Facilities by FWQA Regions. FWQA Publication No. CWT-7, 9 vols., 1970.

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Figure 1.

Table 1. *Municipal Sewage Treatment Summary for the United States*

	Number	Percent
Number of communities with sewer systems	12,911	[1] 100.0
Discharging raw sewage only	1,416	11.0
Discharging treated sewage only	11,422	88.5
Discharging both raw and treated sewage	73	.5
Type sewers-numbers of communities:		
Separate	10,317	85.2
Combined	1,173	9.7
Both separate and combined	621	.5
Not stated	800	.....4.6
1960 Census population of sewered communities	123,843,107	.....
Estimated population:		
Connected to sewers	140,226,049	100.0
Discharging raw	9,541,278	6.8
Discharging treated	130,684,771	93.2
Number of facilities—total	14,123	100.0
Discharging raw	1,558	11.0
Discharging treated	12,565	89.0
TREATMENT		
Treatment plants—total (including 98 unknown degree)	12,565	[1] 100.0
Minor	47	.4
Primary	2,384	19.1
Intermediate	75	.6
Secondary	9,951	79.8
Tertiary	10	.1
Estimated population served by		
Minor treatment [2]	1,360,870	1.0
Primary treatment	36,947,397	28.4
Intermediate treatment	5,857,690	4.5
Secondary treatment	85,640,764	65.8
Tertiary treatment	325,530	.3

[1] Percentage bases exclude 98 unknown or not stated categories.
[2] Less than sedimentation.

Table 2. *Primary Treatment Plants for the United States*

Process	Number of plants	Estimated population served	Percent of—	
			Number of plants	Estimated population served
Septic tanks	363	569,065	15.2	1.5
Imhoff tanks	814	2,295,028	34.1	6.2
Mechanically clean tanks	1,019	31,296,959	42.9	85.0
Plain hopper bottom tanks	53	1,557,335	2.2	4.1
Settling tanks—no details stated	34	339,740	1.4	.8
Other and unknown	101	889,270	4.2	2.4
Total	2,384	36,947,397	100.0	100.0

Table 3. *Secondary Treatment Plants in the United States*

Process	Number of plants	Estimated population served	Percent of	
			Number of plants	Estimated population served
Activated sludge	1,309	38,559,342	13.2	45.0
Extended aeration	801	2,704,694	8.1	3.2
Trickling filters				
Standard rate	2,024	11,982,961	20.3	14.0
High rate	1,762	16,436,265	17.7	19.2
Intermittent sand	247	331,895	2.5	.4
Application to land	128	412,670	1.3	.5
Stabilization pond	3,457	6,123,078	34.7	7.1
Filters type unknown	25	1,197,910	.2	1.4
Others and unknown	198	7,891,949	2.0	9.2
Total	9,951	85,640,764	100.0	100.0

Table 4. *Population Connected to Sewers and Served by Disposal Facilities—by Population Size Groups*

Census population size groups	Population served by size of community shown	Population connected to sewers in size of community shown	Population in community of size shown served by other facilities of any size	Population served by other facilities of the population size group shown
Under 500	693,874	724,254	32,215	1,835
500–1,000	1,828,753	1,911,423	107,515	24,845
1,000–5,000	12,385,893	13,486,873	1,317,468	216,488
5,000–10,000	9,570,149	11,144,565	2,059,211	484,795
10,000–25,000	15,504,150	19,306,985	5,028,406	1,225,571
25,000–50,000	12,697,700	15,896,157	4,292,910	1,094,453
50,000–100,000	13,421,175	16,187,730	4,684,115	1,917,560
100,000–250,000	14,855,310	13,655,615	2,111,825	3,311,520
250,000–500,000	13,620,080	16,014,505	4,269,385	1,874,960
Over 500,000	45,684,965	31,897,942	6,420,720	20,171,743
Total	140,226,049	140,226,049	30,323,770	30,323,770

Table 5. *Summary of communities having sewer systems and sewage disposal by population groups, states, and drainage basins*

	Number of communities	1960 census population	Estimated population served	Type of sewer system in community								Type of treatment status					
				Separate		Combined		Both		Not stated		Treated		Untreated		Both	
				Number	Population	Number	Population	Number	Population	Number	Population	Number	Population	Number	Population	Number	Population
Population Size Groups																	
Under 500	1,791	580,156	693,874	1,526	613,599	56	18,020	16	5,605	193	56,650	1,545	621,899	246	71,465		510
500–1,000	2,259	1,679,823	1,828,753	1,876	1,550,566	158	119,830	45	30,850	180	127,507	1,929	1,599,328	328	226,715	2	2,710
1,000–5,000	5,376	12,643,609	12,385,893	4,351	10,384,413	522	1,079,910	217	467,400	286	454,170	4,725	11,168,843	629	1,154,165	22	62,885
5,000–10,000	1,516	10,662,916	9,570,149	1,163	7,706,256	150	766,020	123	788,700	80	309,173	1,398	8,871,616	105	599,928	13	98,605
10,000–25,000	1,200	18,345,385	15,504,150	903	11,881,310	152	1,749,125	98	1,523,230	47	350,485	1,117	14,352,760	71	928,155	12	223,235
25,000–50,000	422	14,534,275	12,697,700	298	8,903,795	58	1,662,470	62	1,944,745	4	186,690	397	11,952,525	19	557,065	6	188,110
50,000–100,000	203	14,028,076	13,421,175	129	8,280,485	44	2,694,985	23	1,918,290	7	527,415	189	12,552,195	11	652,795	3	216,185
100,000–250,000	85	12,113,053	14,855,310	44	7,206,345	19	4,159,460	21	3,448,600	1	40,905	73	12,869,100	5	814,485	7	1,171,725
250,000–500,000	37	12,923,865	13,620,080	21	7,112,805	7	2,898,975	7	3,118,300	2	490,000	31	11,433,030	2	1,130,000	4	1,087,050
Over 500,000	22	26,331,949	45,648,965	6	11,960,305	7	16,717,275	9	16,221,385		750,000	18	40,256,465			4	5,392,500
States																	
Alabama	180	1,774,327	1,988,965	177	1,981,190					3	7,775	143	1,613,200	30	88,115	7	287,650
Alaska	24	88,607	62,365	21	28,465			3	33,900			5	11,105	18	44,060	1	7,200
Arizona	64	964,505	709,970	63	709,055					1	915	62	688,170	1	20,000	1	1,800
Arkansas	179	869,308	874,125	177	868,910					2	5,215	176	703,455	1	24,855	2	145,815
California	550	10,997,805	16,974,465	499	14,771,000	12	2,170,980			39	32,485	542	16,948,415	5	11,700	3	14,350
Colorado	209	1,286,648	2,420,398	198	1,558,088	1	8,500	2	101,655	8	752,155	195	2,413,203	14	7,195		
Connecticut	76	2,118,126	1,581,155	50	714,145	16	482,950	7	360,200	3	23,860	71	1,554,535	5	26,620		
Delaware	25	167,255	387,610	16	35,885	1	2,495	5	14,775	3	334,455	25	387,610				
District of Columbia	1	763,956	1,750,000					1	1,750,000			1	1,750,000				
Florida	226	2,744,301	2,939,837	206	2,788,725	2	33,770	1	30,000	17	87,342	214	2,644,467	7	36,730	5	258,640
Georgia	239	1,986,717	2,356,340	226	1,272,655	4	772,995	4	285,290	5	25,400	201	2,071,680	31	66,880	7	217,780
Hawaii	19	422,195	498,640	19	482,700						15,940	12	132,740	6	361,700	1	4,200
Idaho	106	337,657	363,870	89	287,860	9	49,405	5	21,455	3	5,150	94	348,880	12	14,990		
Illinois	642	7,795,329	8,536,420	361	1,533,245	140	4,883,850	23	1,758,465	118	360,860	627	8,364,120	14	158,710	1	13,590
Indiana	323	2,880,952	3,603,760	107	486,895	190	3,002,830	3	44,340	23	69,695	237	3,423,810	83	86,850	3	93,100
Iowa	497	1,787,034	1,643,470	460	1,042,960	18	184,560	9	409,050	10	6,900	479	1,625,280	18	18,190		
Kansas	426	1,474,569	1,896,600	403	1,493,800	4	351,400	2	44,500	17	6,900	412	1,664,345	14	232,255		
Kentucky	203	1,287,070	1,382,930	179	657,670	5	171,780	14	553,005	5	475	190	1,370,705	13	12,225		
Louisiana	134	1,801,024	2,322,520	134	2,284,500						38,020	114	1,228,075	16	348,625	4	745,820
Maine	102	684,157	553,115	30	78,755	39	199,785	32	236,500	1	38,075	26	158,185	72	320,430	4	74,500
Maryland	145	1,828,029	1,594,605	120	1,544,280	8	11,300	3	2,500	14	36,525	137	1,585,930	8	8,675		
Massachusetts	199	4,701,398	3,726,010	130	634,910	33	876,840	10	2,102,955	26	111,305	135	3,228,480	61	482,585	3	14,945
Michigan	371	5,830,361	6,668,935	172	1,049,895	85	4,188,495	63	1,302,610	51	127,935	325	6,574,205	46	94,730		
Minnesota	482	2,339,471	2,089,770	455	912,760	25	1,157,270	1	19,690	1	50	450	2,067,140	32	22,630		
Mississippi	177	927,404	995,930	175	975,730			1	20,000	1	200	143	670,810	32	164,020	2	161,100
Missouri	438	2,926,544	3,074,615	374	1,390,960	12	613,745	18	923,310	34	146,600	370	1,937,120	67	1,119,695	1	17,800
Montana	128	406,364	436,780	116	403,180	1	2,500	11	31,100			127	436,180	1	600		

Nebraska	424	963,327	845,695	352	623,865	8	12,185	4	186,630	60	23,015	377	824,030	47	21,665	....	.....	
Nevada	33	161,002	491,295	31	378,895	1	12,500	1	99,900	....	.....	31	489,780	2	1,515	....	.....	
New Hampshire	74	473,471	300,800	28	93,350	21	82,650	23	119,300	2	5,500	23	132,650	50	166,750	1	1,400	
New Jersey	363	5,468,989	5,827,710	298	3,718,950	11	289,500	3	1,287,355	51	531,902	363	5,827,710	....	.....	....	.....	
New Mexico	75	626,303	673,970	75	673,970	....	.....	....	.....	....	.....	75	673,970	....	.....	....	.....	
New York	541	14,165,954	15,104,360	384	2,754,500	58	6,836,585	59	5,497,405	40	15,870	433	9,523,625	98	444,315	10	5,136,420	
North Carolina	295	1,808,773	1,980,410	292	1,976,925	1	1,600	....	.....	2	1,885	263	1,846,815	30	127,875	2	5,720	
North Dakota	221	362,324	372,890	196	249,760	18	108,520	3	13,480	4	1,130	211	365,195	10	7,695	....	.....	
Ohio	553	6,821,176	7,822,259	361	2,850,514	127	1,337,780	59	3,623,265	6	10,700	482	7,703,459	70	106,010	1	12,790	
Oklahoma	344	1,641,908	1,660,890	341	1,659,715	....	.....	....	.....	3	1,175	340	1,656,800	4	4,090	....	.....	
Oregon	157	935,475	1,139,292	124	471,612	17	195,200	15	463,930	1	8,550	148	740,242	8	16,650	1	382,400	
Pennsylvania	1,020	9,188,355	10,237,071	641	3,532,566	130	514,010	102	6,084,570	147	105,925	766	9,308,216	250	897,065	4	31,790	
Puerto Rico	78	991,068	826,825	77	816,125	....	.....	....	.....	1	10,700	71	716,160	7	110,665	....	.....	
Rhode Island	26	740,331	549,025	22	184,505	2	.....	2	364,520	....	.....	20	545,070	6	3,955	....	.....	
South Carolina	158	935,037	961,505	156	959,820	....	.....	....	.....	2	1,685	134	656,490	19	148,435	5	156,580	
South Dakota	206	384,259	393,520	179	295,820	17	77,995	7	18,065	3	1,640	189	378,525	17	14,995	....	.....	
Tennessee	172	1,672,085	1,947,325	158	1,491,670	5	428,400	....	.....	9	27,255	159	1,426,030	10	13,170	3	508,125	
Texas	680	7,306,572	8,425,180	672	8,145,830	1	55,000	....	400	7	223,950	680	8,425,180	....	.....	....	.....	
Utah	91	612,145	890,885	90	890,825	1	60	....	.....	....	.....	77	878,770	14	12,115	....	.....	
Vermont	89	258,835	208 300	15	27,210	10	13,780	44	160,455	20	6,855	34	163,180	55	45,120	....	.....	
Virginia	189	2,113,343	2,286,969	168	1,627,709	3	1,675	7	648,325	11	9,260	169	2,268,944	20	18,025	....	.....	
Virgin Islands	3	20,194	31,768	....	.....	....	.....	....	.....	3	31,768	....	.....	3	31,768	....	.....	
Washington	214	1,142,003	1,865,590	146	798,000	36	891,515	11	157,605	21	18,470	203	1,708,525	10	7,065	1	150,000	
West Virginia	184	820,003	849,715	88	236,740	73	526,315	18	81,860	5	4,800	109	717,855	75	131,860	....	.....	
Wisconsin	478	2,808,759	2,843 795	392	898,940	28	1,315,350	45	614,740	13	14,765	477	2,843,645	1	150	....	.....	
Wyoming	78	230,303	255,805	74	253,845	....	.....	....	.....	4	1,960	75	255,050	3	755	....	.....	
MAJOR DRAINAGE BAISINS																		
Northeast	1,308	27,069,682	26,150,270	836	7,111,370	181	8,537,320	171	9,867,585	120	633,995	957	19,457,465	334	1,467,740	17	5,225,065	
North Atlantic	984	11,852,399	14,120,086	700	6,146,821	89	643,715	63	6,811,820	132	517,730	831	13,453,901	151	656,825	2	9,360	
Southeast	1,161	9,837,647	10,701,976	1,121	9,453,179	6	806,765	6	317,990	28	124,042	1,020	9,174,401	116	473,535	25	1,054,040	
Tennessee River	171	1,028,218	1,360,320	154	1,162,260	5	171,050	1	2,845	11	24,165	144	1,294,025	23	24,365	4	41,930	
Ohio River	1,579	11,487,592	12,843,855	993	4,995,040	353	3,883,705	131	3,813,990	102	151,120	1,255	12,190,665	320	538,775	4	114,415	
Lake Erie	231	3,510,825	4,141,429	122	944,364	77	750,795	25	2,440,355	7	5,915	185	4,063,909	45	69,630	1	7,890	
Upper Mississippi	1,968	13,651,820	13,757,860	1,538	3,977,450	212	6,364,825	66	3,012,885	152	402,700	1,850	12,503,325	114	1,214,930	4	39,605	
Western Great Lakes	596	8,654,306	9,796,845	333	1,508,565	124	6,299,815	85	1,837,510	54	150,955	545	9,697,675	51	99,170	....	.....	
Missouri River	1,574	5,369,346	6,782,690	1,410	4,444,070	45	1,015,720	28	444,745	91	878,155	1,466	6,403,240	108	379,450	....	.....	
Southwest-Lower Mississippi	1,249	7,193,102	8,049,208	1,221	7,861,878	3	9,200	4	122,035	21	56,095	1,182	6,115,078	59	542,870	8	1,391,260	
Colorado River	184	1,290,252	1,284,353	176	1,272,033	1	8,500	1	1,655	6	2,165	170	1,249,673	13	32,880	1	1,800	
Western Gulf	640	6,899,433	8,239,197	632	7,961,447	1	55,000	....	400	7	222,350	639	8,238,477	1	720	....	.....	
Pacific Northwest	492	2,820,528	3,563,072	370	1,738,792	62	1,136,120	35	655,990	25	32,170	459	2,991,367	31	39,305	2	532,400	
California	510	10,840,247	16,737,670	461	14,534,705	12	2,170,980	....	.....	34	31,985	503	16,713,635	5	11,700	2	12,335	
Great Basin	140	815,646	1,277,620	130	1,160,615	2	12,560	2	103,400	6	1,045	128	1,270,920	11	4,685	1	2,015	
Alaska	24	88,607	62,365	21	28,465	....	.....	3	33,900	....	.....	5	11,105	18	44,060	1	7,200	
Hawaii	19	422,195	498,640	19	482,700	....	.....	....	.....	....	.....	12	132,740	6	361,700	1	4,200	
Puerto Rico	78	991,068	826,825	77	816,125	....	.....	....	.....	1	10,700	71	716,160	7	110,665	....	.....	
Virgin Islands	3	20,194	31,768	....	.....	....	.....	....	.....	3	31,768	....	.....	3	31,768	....	.....	
Total	12,911	123,843,107	140,226,049	10,317	75,599,879	1,173	31,866,070	621	29,467,105	800	3,292,995	11,422	125,677,761	1,416	6,104,773	73	8,443,515	

Table 5A. *Summary of facilities having sewer systems and sewage disposal by population groups, states, and drainage basins*

	Total		Separate		Combined		Both		Not stated		Treated		Untreated	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS														
Under 500	1,975	693,874	1,711	613,599	54	18,020	15	5,605	195	56,650	1,723	621,959	252	71,915
500–1,000	2,392	1,828,753	2,015	1,550,566	149	119,830	44	30,850	184	127,507	2,057	1,599,828	335	228,925
1,000–5,000	5,666	12,385,893	4,713	384,413	499	1,079,910	202	467,400	252	454,170	4,990	11,193,008	676	1,192,885
5,000–10,000	1,573	9,570,149	1,242	7,706,256	120	766,020	117	788,700	94	309,173	1,437	8,890,051	136	680,098
10,000–25,000	1,248	15,504,150	984	1,881,310	117	1,749,125	88	1,523,230	59	350,485	1,164	14,467,295	84	1,036,855
25,000–50,000	502	12,697,700	371	8,903,795	47	1,662,470	57	1,944,745	27	186,690	473	12,058,065	29	639,635
50,000–100,000	288	13,421,175	201	8,280,485	38	2,694,985	31	1,918,290	18	527,415	269	12,673,695	19	747,480
100,000–250,000	247	14,855,310	165	7,206,345	28	4,159,460	30	3,448,600	24	40,905	230	13,511,350	17	1,343,960
250,000–500,000	154	13,620,080	129	7,112,805	11	2,898,975	10	3,118,300	4	490,000	149	11,997,955	5	1,622,125
Over 500,000	78	45,648,965	31	1,960,305	20	16,717,275	26	16,221,385	1	750,000	73	43,671,565	5	1,977,400
STATES														
Alabama	255	1,988,965	247	1,981,190					8	7,775	204	1,738,770	51	250,265
Alaska	25	62,365	22	28,465			3	33,900			6	11,505	19	50,860
Arizona	71	709,970	70	709,055					1	915	69	688,770	2	21,200
Arkansas	206	874,125	203	868,910					3	5,215	203	797,895	3	76,230
California	555	16,974,465	526	4,771,000	16	2,170,980			13	32,485	546	16,953,835	9	20,630
Colorado	218	2,420,398	204	1,558,088	2	8,500	2	101,655	10	752,155	204	2,413,203	14	7,195
Connecticut	88	1,581,155	61	714,145	15	482,950	8	360,200	4	23,860	83	1,554,535	5	26,620
Delaware	18	387,610	11	35,885	1	2,495	4	14,775	2	334,455	18	387,610		
District of Columbia	1	1,750,000					1	1,750,000			1	1,750,000		
Florida	521	2,939,837	437	2,788,725	2	33,770	1	30,000	81	87,342	510	2,875,207	11	64,630
Georgia	346	2,356,340	329	1,272,655	6	772,995	5	285,290	6	25,400	307	2,159,260	39	197,080
Hawaii	28	498,640	27	482,700					1	15,940	21	132,940	7	365,700
Idaho	105	363,870	88	287,860	9	49,405	5	21,455	3	5,150	93	348,880	12	14,990
Illinois	644	8,536,420	336	1,533,245	103	4,883,850	20	1,758,465	185	360,860	629	8,377,710	15	158,710
Indiana	390	3,603,760	167	486,895	192	3,002,830	3	44,340	28	69,695	302	3,493,210	88	110,550
Iowa	517	1,643,470	482	1,042,960	17	184,560	9	409,050	9	6,900	499	1,625,280	18	18,190
Kansas	452	1,896,600	429	1,493,800	5	351,400	2	44,500	16	6,900	435	1,664,345	17	232,255
Kentucky	252	1,382,930	239	657,670	3	171,780	9	553,005	1	475	239	1,370,705	13	12,225
Louisiana	197	2,322,520	195	2,284,500					2	38,020	173	1,393,945	24	928,575
Maine	112	553,115	35	78,755	40	199,785	34	236,500	3	38,075	33	180,005	79	373,110
Maryland	100	1,594,605	79	1,544,280	6	11,300	3	2,500	12	36,525	92	1,585,930	8	8,675
Massachusetts	162	3,726,010	91	634,910	35	876,840	7	2,102,955	29	111,305	94	2,886,575	68	839,435
Michigan	314	6,668,935	157	1,049,895	58	4,188,495	53	1,302,610	46	127,935	267	6,574,205	47	94,730
Minnesota	443	2,089,770	416	912,760	23	1,157,270	3	19,690	1	50	441	2,067,140	32	22,630
Mississippi	249	995,930	247	975,730			1	20,000	1	200	215	701,610	34	294,320
Missouri	564	3,074,615	494	1,390,960	14	613,745	19	923,310	37	146,600	490	1,953,920	74	1,120,695
Montana	126	436,780	114	403,180	1	2,500	11	31,100			125	436,180	1	600
Nebraska	431	845,695	357	623,865	8	12,185	4	186,630	62	23,015	384	821,930	47	21,665

Nevada	31	491,295	29	378,895	1	12,500	1	99,900			29	489,780	2	1,515
New Hampshire	79	300,800	30	93,350	23	82,650	24	119,300	2	5,500	27	132,850	52	167,950
New Jersey	318	5,827,710	224	3,718,950	7	289,500	4	1,287,355	83	531,905	318	5,827,710		
New Mexico	80	673,970	80	673,970							80	673,970		
New York	620	15,104,360	461	2,754,500	65	6,836,585	79	5,497,405	15	15,870	507	13,501,395	113	1,602,965
North Carolina	382	1,980,410	379	1,976,925	1	1,600			2	1,885	349	1,847,325	33	133,085
North Dakota	221	372,890	196	249,760	18	108,520	3	13,480	4	1,130	211	365,195	10	7,695
Ohio	609	7,822,259	428	2,850,514	111	1,337,780	61	3,623,265	9	10,700	537	7,707,459	72	114,800
Oklahoma	374	1,660,890	371	1,659,715					3	1,175	370	1,656,800	4	4,090
Oregon	176	1,139,292	141	471,612	17	195,200	15	463,930	3	8,550	167	1,102,642	9	36,650
Pennsylvania	746	10,237,071	508	3,532,566	106	514,010	84	6,084,570	48	105,925	486	9,309,041	260	928,030
Puerto Rico	98	826,825	95	816,125					3	10,700	91	716,160	7	110,665
Rhode Island	22	549,025	19	184,505			3	364,520			16	545,070	6	3,955
South Carolina	261	961,505	256	959,820					5	1,685	224	703,240	37	258,265
South Dakota	207	393,520	180	295,820	17	77,995	7	18,065	3	1,640	190	378,525	17	14,995
Tennessee	213	1,947,325	190	1,491,670	5	428,400			18	27,255	200	1,429,830	13	517,495
Texas	911	8,425,180	886	8,145,830	1	55,000	2	400	22	223,950	911	8,425,180		
Utah	78	890,885	77	890,825	1	60					64	878,770	14	12,115
Vermont	94	208,300	18	27,210	10	13,780	46	160,455	20	6,855	38	163,180	56	45,120
Virginia	273	2,286,969	252	1,627,709	3	1,675	8	648,325	10	9,260	253	2,268,944	20	18,025
Virgin Islands	3	31,768							3	31,768			3	31,768
Washington	221	1,865,590	152	798,000	38	891,515	12	157,605	19	18,470	208	1,798,525	13	67,065
West Virginia	193	849,715	94	236,740	75	526,315	19	81,860	5	4,800	118	717,855	75	131,860
Wisconsin	442	2,843,795	356	898,940	28	1,315,350	45	614,740	13	14,765	440	2,843,145	2	650
Wyoming	81	255,805	77	253,845					4	1,960	78	255,050	3	755
Major Drainage Basins														
Northeast	1,300	26,150,270	786	7,111,370	187	8,537,320	195	9,867,585	132	633,995	935	23,115,300	365	3,034,970
North Atlantic	882	14,120,086	679	6,146,821	82	643,715	63	6,811,820	58	517,730	730	13,454,831	152	665,255
Southeast	1,877	10,701,976	1,761	9,453,179	8	806,765	7	317,990	101	124,042	1,708	9,663,351	169	1,038,625
Tennessee River	203	1,360,320	178	1,162,260	5	171,050	1	2,845	19	24,165	176	1,328,955	27	31,365
Ohio River	1,599	12,843,855	1,078	4,995,040	323	3,883,705	110	3,813,990	88	151,120	1,266	12,264,260	333	579,595
Lake Erie	273	4,141,429	164	944,364	74	750,795	27	2,440,355	8	5,915	227	4,064,009	46	77,420
Upper Mississippi	1,942	13,757,860	1,512	3,977,450	164	6,364,825	62	3,012,885	204	402,700	1,818	12,535,365	124	1,222,495
Western Great Lakes	545	9,796,845	311	1,508,565	104	6,299,815	78	1,837,510	52	150,955	491	9,695,175	54	101,670
Missouri River	1,693	6,782,690	1,518	4,444,070	48	1,015,720	29	444,745	98	878,155	1,582	6,403,240	111	379,450
Southwest-Lower Mississippi	1,448	8,049,208	1,416	7,861,878	3	9,200	4	122,035	25	56,095	1,377	6,377,188	71	1,672,020
Colorado River	194	1,284,353	185	1,272,033	2	8,500	1	1,655	6	2,165	180	1,250,273	14	34,080
Western Gulf	860	8,239,197	836	7,961,447	1	55,000	2	400	21	222,350	859	8,228,477	1	720
Pacific Northwest	513	3,563,072	388	1,738,792	64	1,136,120	36	655,990	25	32,170	478	3,443,767	35	119,305
California	512	16,737,670	484	4,534,705	16	2,170,980			12	31,985	504	16,718,180	8	19,490
Great Basin	128	1,277,620	122	1,160,615	2	12,560	2	103,400	2	1,045	116	1,271,795	12	5,825
Alaska	25	62,365	22	28,465			3	33,900			6	11,505	19	50,860
Hawaii	28	498,640	27	482,700					1	15,940	21	132,940	7	365,700
Puerto Rico	98	826,825	95	816,125					3	10,700	91	716,160	7	110,665
Virgin Islands	3	31,768							3	31,768			3	31,768
Total	14,123	140,226,049	11,562	75,599,879	1,083	31,866,070	620	29,467,105	858	3,292,995	12,565	130,684,771	1,558	9,541,278

Table 5A. *Summary of facilities having sewer systems and sewage disposal by population groups, states, and drainage basins*—Continued

	Total including degree unknown		Minor		Primary		Intermediate		Secondary		Tertiary	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS												
Under 500	1,723	621,959	1	160	253	135,582			1,457	482,202		
500–1,000	2,057	1,599,828	6	4,545	356	357,846	3	2,075	1,677	1,224,567		
1,000–5,000	4,990	11,193,008	21	42,295	981	2,333,874	13	41,670	3,925	8,695,524	3	7,420
5,000–10,000	1,437	8,890,051	7	29,685	287	1,803,310	11	103,775	1,121	6,882,951	4	31,610
10,000–25,000	1,164	14,467,295	3	23,500	251	3,516,335	21	330,235	882	10,483,205	1	13,500
25,000–50,000	473	12,058,065	1	40,000	112	3,019,475	8	314,565	347	8,603,275		
50,000–100,000	269	12,673,695	2	108,000	54	3,606,320	7	565,900	203	8,268,335	1	65,000
100,000–250,000	230	13,511,350	3	322,260	56	5,202,805	3	378,080	163	7,214,850	1	208,000
250,000–500,000	149	11,997,955			19	3,472,445	2	912,550	128	7,612,960		
Over 500,000	73	43,671,565	3	790,425	15	13,499,405	7	3,208,840	48	26,172,895		
STATES												
Alabama	204	1,738,700	2	8,200	63	709,795			128	968,375		
Alaska	6	11,505			5	11,105			1	400		
Arizona	69	688,770			4	5,045			60	680,825		
Arkansas	203	797,895			22	205,250			181	592,645		
California	546	16,953,835			96	7,717,385	2	230,000	441	8,752,635		
Colorado	204	2,413,203			19	52,590	1	615,350	184	1,745,263		
Connecticut	83	1,554,535	1	3,500	45	1,063,245	2	126,900	35	360,890		
Delaware	18	387,610			6	17,285			12	370,325		
District of Columbia	1	1,750,000							1	1,750,000		
Florida	510	2,875,207	5	65,350	62	793,650			437	2,008,602		
Georgia	307	2,159,260			79	516,960			228	1,642,300		
Hawaii	21	132,940	1	10,000	6	38,940			14	84,000		
Idaho	93	348,880	1	4,000	25	147,360			65	196,620		
Illinois	629	8,377,710	12	12,195	78	856,010	1	1,040	523	7,500,175		
Indiana	302	3,493,210			40	344,075	1	5,800	261	3,143,335		
Iowa	499	1,625,280			28	353,055			461	979,425	4	286,500
Kansas	435	1,664,345			36	228,975			397	1,434,550		
Kentucky	239	1,370,705			28	217,630	2	163,795	209	989,280		
Louisiana	173	1,393,945			11	382,275			162	1,011,670		
Maine	33	180,005			22	125,055			10	52,950		
Maryland	92	1,585,930			29	186,930			63	1,399,000		
Massachusetts	94	2,886,575	9	1,038,790	28	501,005			53	1,321,145		
Michigan	267	6,574,205	2	6,030	116	4,698,690	2	22,600	142	1,840,885		
Minnesota	411	2,067,140			60	258,780			349	1,798,600	2	9,760
Mississippi	215	701,610			20	25,300			195	676,310		
Missouri	490	1,953,920			31	818,660			458	1,135,060		
Montana	125	436,180			21	234,700	1	5,300	102	150,180		
Nebraska	384	824,030			44	287,765	1	1,100	337	534,485		

Nevada	29	489,780			3	4,900			26	484,880		
New Hampshire	27	132,850			11	105,650			16	27,200		
New Jersey	318	5,827,710	1	12,000	98	3,290,410	5	449,300	212	2,059,730	1	1,270
New Mexico	80	673,970			1	1,600			79	672,370		
New York	507	13,501,395	3	187,000	261	4,132,605	8	148,665	234	9,032,125		
North Carolina	349	1,847,325			85	119,460			263	1,726,580		
North Dakota	211	365,195			21	13,425			190	351,770		
Ohio	537	7,707,459			84	820,360	33	1,516,360	417	5,368,739		
Oklahoma	370	1,656,800			21	171,090			349	1,485,710		
Oregon	167	1,102,642			33	419,302			134	683,340		
Pennsylvania	486	9,309,041	2	4,505	138	2,475,035	8	2,426,565	330	4,338,616	1	4,500
Puerto Rico	91	716,160			36	381,515			52	327,745		
Rhode Island	16	545,070			8	180,940			8	364,130		
South Carolina	224	703,240	3	2,840	67	109,550	1	170	149	568,155		
South Dakota	190	378,525			27	39,785			163	338,740		
Tennessee	200	1,429,830	1	2,000	33	352,830			162	1,068,965		
Texas	911	8,425,180	1	160	78	113,196			827	8,296,224	1	13,500
Utah	64	878,770			17	29,765			47	849,005		
Vermont	38	163,180			31	147,480			7	15,700		
Virginia	253	2,268,944			67	1,234,444	1	17,000	184	1,007,500	1	10,000
Virgin Islands												
Washington	208	1,798,525			84	1,140,245	1	10,000	122	626,280		
West Virginia	118	717,855	1	2,400	55	504,305			62	211,150		
Wisconsin	440	2,843,145	2	1,900	94	319,025	4	112,845	339	2,408,995		
Wyoming	78	255,050			7	42,965	1	4,900	70	207,185		
Major Drainage Basins												
Northeast	935	23,115,300	14	1,241,290	445	8,986,560	14	716,050	455	12,141,495	1	1,270
North Atlantic	730	13,454,831	3	6,905	200	2,288,805	8	2,369,915	513	8,722,306		
Southeast	1,708	9,663,351	10	76,390	354	2,234,619	1	170	1,321	7,270,427	1	10,000
Tennessee River	176	1,328,955			50	450,555			122	862,365		
Ohio River	1,266	12,264,260	2	4,300	282	3,556,830	24	1,401,605	950	7,289,125		
Lake Erie	227	4,064,009			17	479,545	14	366,815	194	3,213,049	1	4,500
Upper Mississippi	1,818	12,535,365	13	11,795	221	1,473,385	4	63,200	1,558	10,680,535	6	296,260
Western Great Lakes	491	9,695,175	2	6,030	166	5,007,795	3	73,285	315	4,602,065		
Missouri River	1,582	6,403,240			163	1,617,085	3	621,750	1,407	4,112,505		
Southwest-Lower Mississippi	1,377	6,377,188			108	818,065			1,268	5,558,823		
Colorado River	180	1,250,273			23	26,575			152	1,220,798		
Western Gulf	859	8,238,477	1	160	56	93,916			798	8,129,101	1	13,500
Pacific Northwest	478	3,443,767	1	4,000	144	1,739,472	1	10,000	329	1,667,395		
California	504	16,718,180			89	7,696,910	2	230,000	406	8,537,455		
Great Basin	116	1,271,795			19	45,720	1	4,900	96	1,221,175		
Alaska	6	11,505			5	11,105			1	400		
Hawaii	21	132,940	1	10,000	6	38,940			14	84,000		
Puerto Rico	91	716,160			36	381,515			52	327,745		
Virgin Islands												
Total	12,565	130,684,771	47	1,360,870	2,384	36,947,397	75	5,857,690	9,951	85,640,764	10	325,530

Table 6. *Summary of primary treatment plants by population groups, states and drainage basins*

	Total		Septic tanks		Imhoff tanks		Mechanically cleaned tanks		Plain hopper bottom tanks		Tanks with no detail		Others and unknown	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS														
Under 500	253	135,582	97	24,295	124	39,167	23	60,135	3	1,475	2	600	4	9,910
500–1,000	356	357,846	80	112,005	183	130,911	67	71,290	11	12,775	6	14,550	9	16,315
1,000–5,000	981	2,333,874	148	284,385	412	780,280	351	1,046,539	27	62,800	12	77,655	31	82,215
5,000–10,000	287	1,803,310	18	52,350	39	174,320	193	1,342,825	4	24,540	8	57,895	25	151,380
10,000–25,000	251	3,516,335	14	77,980	32	272,695	177	2,968,905	4	14,145	1	16,000	23	166,610
25,000–50,000	112	3,019,475	5	17,650	9	79,820	91	2,760,065	1	1,400	2	97,040	4	63,500
50,000–100,000	54	3,606,320	1	400	2	3,500	47	3,199,220	2	340,200	2	63,000		
100,000–250,000	56	5,202,805			8	134,835	44	5,041,810			1	13,000	3	13,160
250,000–500,000	19	3,472,445			4	379,500	14	2,712,765					1	380,180
Over 500,000	15	13,499,405			1	300,000	12	12,093,405	1	1,100,000			1	6,000
STATES														
Alabama	63	709,795	25	18,715	22	21,215	15	669,365					1	500
Alaska	5	11,105	4	1,105									1	10,000
Arizona	4	5,045	2	4,540	1	105			1	400				
Arkansas	22	205,250			6	7,000	16	198,250						
California	96	7,717,385	18	9,920	13	19,425	54	7,560,160	1	9,770	6	69,690	4	48,420
Colorado	19	52,590	5	1,500	6	3,475	8	47,615						
Connecticut	45	1,063,245	5	24,610	2	11,500	34	1,018,920	3	4,215			1	4,000
Delaware	6	17,285			1	3,500	3	7,545					2	6,240
District of Columbia														
Florida	62	793,650	10	17,400	9	4,935	36	753,615	4	4,400			3	13,300
Georgia	79	516,960	12	9,425	39	49,580	27	456,455	1	1,500				
Hawaii	6	38,940					3	7,500					1	31,440
Idaho	25	147,360	9	6,255	2	1,050	13	139,355					1	700
Illinois	78	856,010	5	8,395	24	65,345	42	758,670	2	2,200	1	40	4	21,360
Indiana	40	344,075	2	720	12	27,195	22	314,350					4	1,810
Iowa	28	353,055	4	2,825	9	4,080	10	338,000	5	8,150				
Kansas	36	228,975			19	27,950	17	201,025						
Kentucky	28	217,630			8	11,470	20	206,160						
Louisiana	11	382,275	3	1,975	4	16,100	4	364,200						
Maine	22	125,055	5	4,295	3	8,460	9	77,100	1	10,000			4	25,200
Maryland	29	186,930	3	1,020	16	23,100	8	161,010	1	800			1	1,000
Massachusetts	28	501,005	3	2,550	4	3,160	19	489,035	1	700			1	5,560
Michigan	116	4,698,690	11	8,905	14	20,825	91	4,668,960						
Minnesota	60	258,780	1	170	31	19,370	24	234,420	2	590			2	4,230
Mississippi	20	25,300	15	14,500	4	6,300	1	4,500						
Missouri	31	818,660	9	6,395	6	3,665	15	807,800					1	800
Montana	21	234,700	7	2,400	4	2,000	10	230,300						
Nebraska	44	287,765	2	950	21	16,720	16	262,415	4	4,880			1	2,800

Nevada	3	4,900	1	1,500	1	2,000	1	1,400						
New Hampshire	11	105,650			4	25,500	7	80,150						
New Jersey	98	3,290,410	13	135,895	8	88,655	26	1,312,085	3	1,356,500	12	199,295	36	197,980
New Mexico	1	1,600			1	1,600								
New York	261	4,132,605	46	65,925	89	758,745	115	3,260,510	1	1,350			10	46,075
North Carolina	85	119,460	16	7,970	55	51,425	10	56,600	2	1,365	1	1,100	1	1,000
North Dakota	21	13,425	6	3,210	13	6,030	1	2,100	1	2,085				
Ohio	84	820,360	6	5,460	38	378,880	39	428,295					1	7,725
Oklahoma	21	171,090	9	3,670	9	6,820	2	159,000	1	1,600				
Oregon	33	419,302	7	3,380	7	6,132	19	409,790						
Pennsylvania	138	2,475,035	9	37,670	49	216,205	59	2,121,855	3	7,870	12	68,620	6	22,815
Puerto Rico	36	381,515	16	98,310	15	59,000	5	224,205						
Rhode Island	8	180,940	1	480			6	179,460	1	1,000				
South Carolina	67	109,550	22	15,370	38	35,940	6	48,240					1	10,000
South Dakota	27	39,785			23	12,085	4	27,700						
Tennessee	33	352,830			9	14,550	17	330,995	3	3,465	1	700	3	3,120
Texas	78	113,196	8	8,500	62	78,846	4	16,450	4	9,400				
Utah	17	29,765	10	5,825	5	15,580	2	8,360						
Vermont	31	147,430	1	300	13	17,970	16	125,410	1	3,800				
Virginia	67	1,234,444	8	7,070	29	30,680	29	1,190,694					1	6,000
Virgin Islands														
Washington	84	1,140,245	11	8,950	22	23,085	45	690,510	1	5,220			5	412,480
West Virginia	55	504,305	6	7,950	25	77,915	15	297,650	6	116,075			3	4,715
Wisconsin	94	319,025	3	1,535	18	8,860	72	308,335			1	295		
Wyoming	7	42,965	4	1,525	1	1,000	2	40,440						
Major Drainage Basins														
Northeast	445	8,986,560	65	210,340	111	860,030	212	6,116,895	11	1,377,565	11	199,195	35	222,535
North Atlantic	200	2,288,805	20	36,475	71	204,650	76	1,947,809	3	7,470	7	20,865	23	71,545
Southeast	354	2,234,619	85	67,575	161	162,025	95	1,972,854	7	7,265	1	1,100	5	23,800
Tennessee River	50	450,555	7	10,870	15	21,455	23	412,965	3	3,465	1	700	1	1,100
Ohio River	282	3,556,830	20	45,600	111	289,055	127	3,027,670	7	117,275	6	47,855	11	29,375
Lake Erie	17	479,545	2	640	7	327,320	7	143,860					1	7,725
Upper Mississippi	221	1,473,385	17	13,320	65	57,625	123	1,366,670	9	10,940	1	40	6	24,790
Western Great Lakes	166	5,007,795	15	10,610	29	60,410	118	4,934,720			1	295	3	1,760
Missouri River	163	1,617,085	17	8,280	83	62,775	56	1,535,465	5	6,965			2	3,600
Southwest-Lower Mississippi	108	818,065	26	20,295	51	58,445	29	737,125	2	2,200				
Colorado River	23	26,575	13	10,075	5	2,535	4	13,565	1	400				
Western Gulf	56	93,916	7	4,400	41	62,766	5	17,950	3	8,800				
Pacific Northwest	144	1,739,472	26	17,910	32	31,467	79	1,271,695	1	5,220			6	413,180
California	89	7,696,910	15	8,245	10	16,125	53	7,544,660	1	9,770	6	69,690	4	48,420
Great Basin	19	45,720	8	5,015	7	19,345	4	21,360						
Alaska	5	11,105	4	1,105									1	10,000
Hawaii	6	38,940					3	7,500					3	31,440
Puerto Rico	36	381,515	16	98,310	15	59,000	5	224,205						
Virgin Islands														
Total	2,384	36,947,397	363	569,065	814	2,295,028	1,019	31,296,959	53	1,557,335	34	339,740	101	889,270

Table 7. *Summary of secondary treatment plants by population groups, states, and drainage basins*

	Total		Activated sludge		Extended aeration		Trickling filter standard rate		Trickling filter high rate		Intermittent sand filter		Application to land		Stabilization ponds		Others and unknown	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS																		
Under 500	1,457	482,202	114	42,370	147	48,519	135	51,460	53	22,785	59	26,360	36	10,580	896	273,098	17	7,030
500–1,000	1,677	1,224,567	139	111,247	155	114,430	322	237,310	136	116,175	60	35,890	32	23,760	816	571,600	17	14,155
1,000–5,0000	3,925	8,695,524	437	1,145,645	315	592,785	934	2,230,260	709	1,981,035	67	113,545	41	88,740	1,336	2,329,800	86	213,714
5,000–10,000	1,121	6,882,951	177	1,316,645	65	213,580	307	1,990,356	313	2,111,070	29	45,540	8	52,335	179	904,900	43	248,525
10,000–25,000	882	10,483,205	165	2,712,120	41	144,650	212	2,600,545	284	3,630,765	22	108,075	5	52,560	132	993,385	21	241,105
25,000–50,000	347	8,603,275	102	2,939,970	33	289,835	53	1,361,870	103	3,102,485	7	1,585	2	88,685	36	444,280	11	374,565
50,000–100,000	203	8,268,335	67	4,243,290	10	158,325	25	1,190,215	65	1,991,870	2	400	3	96,000	27	319,235	4	269,000
200,000–250,000	163	7,214,850	51	4,291,760	21	30,300	14	675,530	54	1,619,105	1	500	1	10	16	209,345	5	388,300
150,000–500,000	128	7,612,960	31	3,323,330	13	877,270	17	1,624,815	41	856,475					15	64,335	11	866,735
Over 500,000	48	26,172,895	26	18,432,965	1	235,000	5	20,600	4	1,004,500					4	13,100	8	6,466,730
STATES																		
Alabama	128	968,375	5	242,460	11	12,810	20	159,040	33	317,810								
Alaska	1	400	1	400									1	120	56	109,935	2	126,200
Arizona	60	680,825	3	452,700	1	400	10	76,545	1	10,000								
Arkansas	181	592,645	4	4,745	1	1,200	7	59,560	38	222,525			6	1,415	38	133,765	1	6,000
California	441	8,752,635	92	2,329,615	9	33,005	72	1,179,970	44	729,470	3	14,510	56	289,140	131	304,615		
Colorado	184	1,745,263	6	808,500	24	120,940	12	32,750	34	655,105	3	1,180	5	1,950	156	938,915	9	3,238,010
Connecticut	35	360,890	9	115,700	1	40,000	6	32,300	9	162,460	10	10,430			[illegible]	122,788	2	2,050
Delaware	12	370,325	3	336,905	2	3,310	3	9,960	2	16,645					1	2,895	1	1,010
District of Columbia	1	1,750,000	1	1,750,000														
Florida	437	2,008,602	72	787,465	41	25,480	6	39,190	237	1,049,870	11	6,865	1	10	63	65,222	6	34,500
Georgia	228	1,642,300	16	191,135	26	33,125	56	426,760	25	406,500	1	125			103	133,195	1	451,460
Hawaii	14	84,000	1	9,800	7	9,000	1	25,000	3	33,000					1	200	1	2,000
Idaho	65	196,620	5	62,660			2	15,000	12	54,000					46	64,960		
Illinois	523	7,500,175	105	5,865,735	3	51,500	203	1,053,395	25	288,650	14	12,270	1	500	150	181,825	13	46,260
Indiana	261	3,143,335	77	1,549,500	61	925,225	35	168,020	52	278,405	2	685			29	53,315	5	168,185
Iowa	461	979,425	11	27,810	3	1,225	200	615,355	45	128,825	37	17,940	1	600	162	185,770	2	2,100
Kansas	397	1,434,550	20	186,440			195	920,320	8	186,100	4	3,000			168	25,200	2	13,400
Kentucky	209	989,280	9	109,495	100	118,005	30	124,240	56	211,355					12	16,950	2	410,135
Louisiana	162	1,011,670	18	295,455	12	10,780	19	89,880	43	436,820					70	178,735		
Maine	10	52,950	1		8003	30,500					1	600	1	250	6	19,800		
Maryland	63	1,399,000	15	1,264,465	8	13,040	3	9,665	16	81,465	3	10,325			18	19,980		
Massachusetts	53	1,321,145	4	78,150	3	1,200	12	151,455	13	268,440	19	38,130	1	5,000				
Michigan	142	1,840,885	37	1,258,535	3	5,230	32	92,495	27	196,095	5	20,500			37	6,030	1	728,730
Minnesota	349	1,798,600	39	86,375	12	10,865	55	124,970	127	398,930			2	950	101	129,185	1	229,000
Mississippi	195	676,310	4	92,500	1	3,500	5	32,500	16	156,150	3	1,550			166	390,110	13	1,056,300
Missouri	458	1,135,060	29	309,800	11	25,775	93	321,500	14	64,030	16	2,650			289	397,955	6	14,200
Montana	102	150,180	5	3,800			2	2,600										
Nebraska	337	534,485	46	220,860	34	14,490	47	43,275	18	115,370	2	500	2	1,150	93	142,100		
Nevada	26	484,880	2	100,900	1	4,900	2	1,770	3	322,655					18	139,455		
New Hampshire	16	27,200					5	7,700	1	4,000	2	2,300	5	2,750	13	12,950		
													11	1400	7	13,350		

New Jersey	212	2,059,730	50	822,915	42	101,500	38	362,485	47	587,945	11	37,195	1	37,685	2	11,900	21	98,105
New Mexico	79	672,370			1	700	9	25,950	39	623,195			1	1,645	29	29,880		
New York	234	9,032,125	22	5,814,695	44	467,685	55	389,280	67	645,840	28	41,035			2	14,040	16	1,659,550
North Carolina	263	1,726,580	50	590,025	45	58,605	22	121,655	93	849,700	18	27,685	1	300	34	78,610		
North Dakota	190	351,770					3	52,400					5	3,325	182	296,945		
Ohio	417	5,368,739	111	3,947,570	161	280,099	79	809,975	27	244,195	8	10,850			19	32,495	12	43,555
Oklahoma	349	1,485,710	15	318,415	11	32,055	111	494,610	22	414,995					187	196,135	3	29,500
Oregon	134	683,340	21	134,360	2	850	22	70,240	50	395,640	1	710	2	250	36	81,290		
Pennsylvania	330	4,338,616	75	2,580,907	38	136,915	103	709,860	55	549,950	16	36,060	2	1,240	6	31,585	35	292,099
Puerto Rico	52	327,745	8	19,665					44	308,080								
Rhode Island	8	364,130	5	335,760			2	27,970							1	400		
South Carolina	149	568,155	15	13,400	16	42,025	26	189,240	26	206,650	3	1,645			63	115,195		
South Dakota	163	338,740	2	71,150			25	51,075	8	99,100					128	117,415		
Tennessee	162	1,068,965	25	598,625	19	26,590	48	230,145	19	128,940	1	1,000	1	550	44	51,225	5	31,890
Texas	827	8,296,224	121	2,466,540	7	9,425	145	1,369,916	208	3,588,715	20	29,880	8	24,600	278	688,813	40	118,335
Utah	47	849,005	1	9,100			36	795,895	2	7,700			1	100	7	36,210		
Vermont	7	15,700	4	3,200					2	12,300					1	200		
Virginia	184	1,007,500	24	360,725	5	2,520	29	66,935	37	378,250	1	50			72	95,925	16	103,095
Virgin Islands																		
Washington	122	626,280	3	122,700	1	300	11	74,070	43	169,790	1	300	12	16,355	48	151,295	3	91,470
West Virginia	62	211,150	3	24,000	24	38,525	11	54,980	5	31,580			3	1,465	14	21,600	2	39,000
Wisconsin	339	2,408,995	113	1,782,635	2	975	112	202,880	65	382,525	2	1,530	4	5,635	39	24,495	2	8,320
Wyoming	70	207,185	1	250	5	10,420	4	68,145	1	11,500	1	175	4	15,720	52	96,575	2	4,400
Major Drainage Basins																		
Northeast	455	12,141,495	72	7,007,280	83	593,875	79	613,970	116	1,319,895	63	120,835	3	5,350	14	35,130	25	2,445,160
North Atlantic	513	8,722,306	107	5,915,622	39	139,040	124	957,085	99	1,212,620	18	30,890	3	38,925	73	121,510	50	306,614
Southeast	1,321	7,270,427	159	1,921,085	127	155,745	134	944,365	420	2,905,350	35	36,870	3	430	434	799,922	9	506,660
Tennessee River	122	862,365	15	334,270	21	28,940	34	176,500	21	139,015	1	1,000	1	550	24	34,000	5	148,090
Ohio River	950	7,289,125	171	2,885,920	281	1,289,060	209	1,339,945	155	884,325	21	36,685	3	1,465	77	112,005	33	739,720
Lake Erie	194	3,213,049	54	2,867,995	82	128,629	27	115,025	12	63,000	2	1,745			14	29,615	3	7,040
Upper Mississippi	1,558	10,680,535	213	6,169,185	27	67,630	490	1,830,015	229	905,765	45	21,740	8	7,965	520	567,195	26	1,111,040
Western Great Lakes	315	4,602,065	123	3,529,410	14	18,370	64	198,370	59	486,500	5	20,500			46	53,505	4	295,410
Missouri River	1,407	4,112,505	82	1,425,340	53	141,875	264	708,505	65	689,110	24	10,960	11	19,780	899	1,088,385	9	28,550
Southwest-Lower Mississippi	1,268	5,558,823	62	951,315	37	75,370	306	1,614,985	152	1,751,740	8	11,090	8	14,275	687	1,072,993	8	67,055
Colorado River	152	1,220,798	5	456,200	8	6,480	18	103,025	19	441,655	3	1,180	9	2,090	89	204,168	1	6,000
Western Gulf	798	8,129,101	111	2,305,620	8	10,125	134	1,064,406	218	3,940,410	17	22,880	4	13,745	269	674,875	37	97,040
Pacific Northwest	329	1,667,395	30	320,620	4	2,650	35	312,110	102	614,080	1	300	14	16,605	140	309,560	3	91,470
California	406	8,537,455	90	2,304,510	8	32,405	68	1,174,470	43	700,520	3	1,220	48	280,570	137	805,750	9	3,238,010
Great Basin	96	1,221,175	5	135,105	2	5,500	37	805,185	5	36,200	1	14,000	13	10,920	33	214,265		
Alaska	1	400	1	400														
Hawaii	14	84,000	1	9,800	7	9,000	1	25,000	3	38,000					1	200	1	2,000
Puerto Rico	52	327,745	8	19,665					44	308,080								
Virgin Islands																		
Total	9,951	85,640,764	1,309	38,559,342	801	2,704,694	2,024	11,982,961	1,762	16,436,265	247	331,895	128	412,670	3,457	6,123,078	223	9,089,859

Table 8. *Summary of selected intermediate and secondary treatment processes by population groups, states, and drainage basins*

	Chemical treatment		Activated sludge		Extended aeration		Application to land		Standard rate filter		High rate filter		Intermittent sand filter		Stabilization ponds	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS																
Under 500			97	38,540	157	51,094	63	16,395	136	51,695	53	22,785	67	25,170	892	275,623
500–1,000	1	600	128	106,155	166	119,972	71	70,380	326	240,285	136	117,405	64	38,620	834	613,330
1,000–5,000	7	40,250	429	1,127,020	319	587,185	214	618,460	954	2,303,400	725	2,023,155	83	154,060	1,488	2,749,580
5,000–10,000	5	30,220	173	1,297,120	66	214,780	66	491,155	317	2,107,906	330	2,238,990	43	105,815	254	1,358,155
10,000–25,000	9	130,740	166	2,722,120	41	144,650	57	882,100	220	2,957,760	295	3,823,495	30	174,285	188	1,591,225
25,000–50,000	5	193,685	103	2,980,970	31	208,835	15	502,890	56	1,421,860	109	3,337,585	16	166,150	64	1,065,825
50,000–100,000	1	92,000	66	4,234,290	11	158,525	10	732,800	34	1,828,615	67	2,081,870	4	46,700	42	596,900
100,000–250,000			51	4,291,760	21	30,300	10	729,610	17	1,153,530	60	2,144,615	4	235,500	41	550,260
250,000–500,000			31	3,323,330	13	877,270	2	823,460	18	1,664,815	43	974,145	5	4,450	24	194,925
Over 500,000			26	18,432,965	1	235,000	4	20,200	5	20,600	5	2,104,500			10	127,500
STATES																
Alabama			5	242,460	11	12,810	1	120	20	159,040	34	381,810			56	109,935
Alaska			1	400												
Arizona			3	452,700	1	400	12	191,135	10	76,545	3	202,700			35	166,265
Arkansas			4	4,745	1	1,200			7	59,560	38	222,525			143	367,590
California	1	15,000	91	2,324,215	10	33,405	258	2,845,070	80	1,598,770	49	765,170	5	2,750	220	1,875,475
Colorado			6	808,500	25	122,590	10	165,250	12	32,750	36	713,105	4	2,480	102	145,198
Connecticut	1	92,000	9	115,700					6	32,300	9	162,460	11	18,630		
Delaware			3	336,905	2	3,310			3	9,960	2	16,645			2	4,945
District of Columbia			1	1,750,000												
Florida			70	787,530	44	25,980	2	3,110	6	39,190	244	1,137,990	12	26,005	190	257,282
Georgia			16	191,135	26	33,125	1	451,460	56	426,760	28	532,160	1	125	106	136,195
Hawaii			1	9,800	7	9,000			1	25,000	3	38,000			3	3,630
Idaho			5	62,660					2	15,000	12	54,000			36	59,120
Illinois	1	1,040	104	5,909,685	3	4,050	2	2,040	215	1,246,265	29	365,500	15	53,270	141	203,055
Indiana	1	30,000	77	1,541,100	59	925,025			36	168,070	52	278,405	10	7,635	35	65,515
Iowa			1	22,000	13	7,035	2	6,900	200	614,855	47	406,660	37	17,940	164	100,140
Kansas	1	15,500	19	177,340			2	5,000	195	920,320	10	203,400	4	3,090	198	242,865
Kentucky	1	5,620	9	109,495	99	115,750			29	116,240	57	219,355	1	10,760	12	17,860
Louisiana			18	295,455	12	10,780			19	89,880	43	436,820			71	184,235
Maine			1	800	3	30,500	1	250					1	600	4	20,800
Maryland	1	800	14	1,265,215	8	11,740			3	9,665	17	1,181,465	4	11,075	21	72,575
Massachusetts			4	78,150	3	1,200	4	16,760	13	203,495	13	268,440	19	38,130	2	18,050
Michigan	2	22,600	37	1,258,535	3	5,230	2	3,480	34	308,885	28	256,095	5	20,500	35	43,930
Minnesota	2	26,770	40	87,105	11	10,135	2	975	58	139,590	129	423,250			112	147,850
Mississippi			4	92,500					4	21,500	17	167,150	3	1,550	166	422,110
Missouri			21	308,960	15	25,995			93	321,500	14	64,030	20	9,890	304	505,205
Montana			5	3,800			4	2,550	2	2,600					86	134,330

Nebraska			46	220,860	34	14,490	2	1,270	47	43,275	19	209,370	2	580	193	140,660
Nevada			1	99,900	2	5,900	10	142,625	2	1,770	3	322,655			14	66,260
New Hampshire							1	100	4	5,700	1	4,000	3	4,300	7	13,100
New Jersey	3	57,900	51	825,715	42	99,970	1	37,685	38	362,485	48	589,215	22	86,070	4	25,900
New Mexico	1	25,000			1	700	27	250,460	9	25,950	39	623,195			37	60,830
New York	2	12,800	21	5,814,460	45	467,885			59	457,975	67	645,840	36	38,490	4	3,150
North Carolina			47	586,315	48	62,315	1	300	23	145,555	96	884,060	26	103,885	38	170,330
North Dakota							5	3,325	3	52,400					181	295,685
Ohio			112	3,954,750	161	280,099	1	1,720	83	874,715	32	286,110	12	18,795	27	63,715
Oklahoma	1	2,100	15	318,415	10	29,055	3	4,670	112	503,210	22	409,395	1	4,300	221	374,225
Oregon			15	129,940	8	5,270	4	11,080	23	80,740	49	385,140	1	710	36	85,710
Pennsylvania	5	97,565	69	2,559,725	42	144,637	4	2,640	108	1,075,235	56	562,135	33	73,340	6	27,785
Puerto Rico			8	19,665							44	308,080				
Rhode Island			5	335,760					2	27,970					1	400
South Carolina			15	13,400	16	42,025			26	189,240	28	231,480	3	1,645	66	122,125
South Dakota			2	71,150					25	51,075	8	99,100			136	228,640
Tennessee			25	598,625	19	26,590	1	550	52	259,675	25	156,990	3	10,600	44	51,225
Texas	1	13,500	121	2,466,340	5	6,925	109	652,125	151	1,488,116	209	3,617,515	19	83,080	361	1,655,638
Utah			1	9,100			1	100	35	779,895	2	7,700			7	36,210
Vermont			4	3,200							2	12,300			1	200
Virginia	1	7,000	24	360,725	5	2,520	1	5,200	29	66,935	38	388,250	1	50	74	102,940
Virgin Islands																
Washington			3	122,700	1	300	16	38,655	11	74,070	43	169,790	1	300	30	129,935
West Virginia			3	24,000	23	38,025	5	6,530	11	54,980	5	31,580			15	22,600
Wisconsin	3	62,300	113	1,782,635	2	975	12	18,420	122	423,615	72	425,010			44	27,985
Wyoming					6	10,670	5	15,895	4	68,145	1	11,500	1	175	46	104,950
Major Drainage Basins																
Northeast	5	157,400	71	7,007,045	84	555,345	6	17,110	83	732,665	117	1,321,165	83	174,945	21	69,700
North Atlantic	5	23,700	104	5,918,670	40	136,307	6	45,525	128	1,311,825	101	2,324,620	29	54,880	78	166,350
Southeast			154	1,917,440	133	159,955	5	454,990	134	957,265	438	3,263,320	44	132,210	571	1,022,932
Tennessee River			15	334,270	21	28,940	1	550	34	176,500	25	161,515	1	1,000	25	124,000
Ohio River	4	118,085	169	2,864,020	279	1,292,460	6	8,250	218	1,476,330	158	903,230	43	77,590	78	138,020
Lake Erie	1	4,500	54	2,867,995	82	128,629			26	127,595	17	99,745	2	1,745	20	55,870
Upper Mississippi	3	27,810	197	6,208,055	38	24,640	16	25,680	513	2,182,620	244	1,324,620	45	61,310	530	634,325
Western Great Lakes	5	84,900	123	3,529,410	14	18,370	4	6,550	68	418,380	61	551,800	5	20,500	47	50,930
Missouri River			79	1,424,250	56	142,965	19	27,275	263	702,005	67	829,445	27	13,900	911	1,254,545
Southwest-Lower Mississippi	2	17,600	61	942,215	36	70,520	26	228,490	310	1,655,585	153	1,757,440	11	31,650	775	1,469,583
Colorado River			5	456,200	8	6,480	22	349,265	18	103,025	21	634,355	3	1,180	90	275,478
Western Gulf	2	38,500	111	2,305,420	6	7,625	116	823,640	139	1,176,606	220	3,975,210	16	76,080	343	1,607,150
Pacific Northwest			24	316,200	10	7,070	20	49,735	36	322,610	101	603,580	1	300	111	285,365
California			89	2,299,110	9	32,805	238	2,737,360	76	1,593,270	48	736,220	6	3,460	198	1,695,910
Great Basin	1	15,000	4	134,105	3	6,500	27	113,030	36	789,185	5	36,200			36	260,565
Alaska			1	400												
Hawaii			1	9,800	7	9,000			1	25,000	3	38,000			3	3,600
Puerto Rico			8	19,665							44	308,080				
Virgin Islands																
Total	28	487,495	1,270	38,554,270	826	2,627,611	512	4,887,450	2,083	13,750,466	1,823	18,868,545	316	950,750	3,837	9,114,323

Table 9. *Summary of clorination, grease and grit removal, and sludge processing by population groups, states, and drainage basins*

	Plants with chlorination		Plants with grease removal		Plants with grit removal		Sludge processing—Number of plants with—								
	Number	Population served	Number	Population served	Number	Population served	Septic tanks	Imhoff tanks	Stage digestion	Separate digestion	Sludge beds	Lagoons	Mechanical dewatering	Miscellaneous	None or no organized method
Population Size Groups															
Under 500	323	194,981	1	415	55	67,906	169	322	3	159	386	14	2	182	1,182
500–1,000	550	543,990	1	600	156	149,686	138	548	16	372	851	14	3	298	1,018
1,000–5,000	1,903	5,071,428	27	74,595	1,198	3,382,075	196	1,122	140	1,779	2,759	61	81	1,139	1,614
5,000–10,000	821	5,291,420	20	170,080	647	4,662,745	38	160	150	770	857	18	124	490	253
10,000–25,000	695	9,718,135	32	570,880	608	9,390,335	31	100	221	588	659	26	174	401	195
25,000–50,000	318	8,076,980	16	557,035	282	8,897,855	10	21	116	226	217	19	113	202	74
50,000–100,000	187	8,926,640	17	1,267,280	167	10,539,500	4	14	48	135	121	12	77	123	41
100,000–250,000	170	10,143,380	10	1,162,100	127	12,776,965		37	36	94	102	8	41	90	44
250,000–500,000	97	7,786,920	5	1,839,675	52	10,683,380	1	35	18	67	81	10	20	94	22
Over 500,000	43	25,184,070	9	6,503,000	51	37,472,520		5	6	40	13	9	21	50	13
States															
Alabama	40	682,340			32	1,149,560	28	26	11	56	91		1	75	110
Alaska							4						1	1	5
Arizona	11	517,400			10	514,200	6	4	3	18	19			3	45
Arkansas	18	140,135	1	12,000	27	308,400	2	17	6	55	76		7	60	118
California	213	13,493,895	11	505,800	61	8,073,270	44	72	24	228	238	11	11	49	226
Colorado	61	2,118,975	1	750,000	50	2,178,270	13	19	14	42	73	1	1	7	124
Connecticut	62	1,231,760	1	35,000	62	1,500,180	11	4	30	22	35	4	35	39	8
Delaware	16	50,110			4	343,075		1		12	10		3	3	2
District of Columbia	1	1,750,000			1	1,750,000				1			1	1	
Florida	449	2,664,942			124	1,373,235	24	79	14	314	296		7	93	99
Georgia	84	1,579,235	2	458,460	90	1,605,790	14	48	21	97	175		3	20	129
Hawaii	19	122,740			14	110,340		2		9	5		2	3	7
Idaho	34	275,665			25	244,505	10	2	9	22	30	1		11	58
Illinois	132	1,176,870	10	3,938,210	190	7,488,745	6	166	37	211	299	30	35	71	182
Indiana	178	2,780,790			146	3,131,340	4	47	44	108	121	38	19	113	77
Iowa	11	100,650	7	441,300	112	1,251,100	30	114	18	154	272	13	8	42	184
Kansas	6	90,530			45	1,037,805		151	80	39	242	3	2	90	165
Kentucky	110	523,085	1	9,640	73	623,710	1	16	15	67	110		4	43	106
Louisiana	91	1,187,180	1	10,000	38	923,045	3	32	5	45	69	10	1	29	88
Maine	23	136,460			13	129,100	5	3	3	10	11		5	8	14
Maryland	74	355,335	3	43,100	22	1,379,680	6	11	11	16	43	1	7	15	35
Massachusetts	48	1,202,370	3	134,800	44	1,849,495	9	13	18	12	54		12	33	28
Michigan	211	6,423,095	2	195,850	119	5,835,630	18	18	48	116	162	3	33	40	60
Minnesota	262	1,878,030	7	192,660	66	1,583,240	1	74	27	150	217	5	7	93	120
Mississippi	15	235,550			7	202,000	13	12	2	14	28	1	1	2	185

Missouri	8	148,550	2	36,000	49	1,115,930	23	47	14	66	104	4	27	49	348
Montana	15	241,400			13	239,900	9	5	9	9	19	2	2		101
Nebraska			4	211,450	30	506,795	5	46	5	80	115		19	105	196
Nevada	5	423,555			6	445,655	7	4	3	6	10	1			17
New Hampshire	16	92,850			11	73,700	3	7		4	10		8	12	9
New Jersey	292	4,211,105			107	4,446,080	17	29	9	200	88	3	56	103	32
New Mexico	8	287,200	2	25,800	21	518,800	2	16	14	27	58		1	19	20
New York	385	8,656,535	1	600,000	300	12,729,840	53	132	7	255	99	9	66	407	41
North Carolina	165	1,465,065	7	168,400	150	1,569,960	30	97	29	82	241		20	89	87
North Dakota	2	52,100	1	50,000	3	52,600	9	20	1	1	14			2	195
Ohio	270	3,711,229	44	3,244,475	181	5,921,435	6	87	29	187	277	6	72	80	183
Oklahoma	5	371,365	3	33,200	66	1,054,270	15	74	6	100	176		4	37	191
Oregon	126	1,008,692			62	917,260	9	19	15	80	88	1	2	8	55
Pennsylvania	415	5,574,781	2	67,000	157	7,746,395	23	103	25	222	294	3	80	91	107
Puerto Rico	4	274,545			14	308,235	16	16		41	73	1	1	81	9
Rhode Island	12	498,390	2	99,800	12	498,390	2		1	11	5	1	8	8	3
South Carolina	18	184,355	2	62,775	44	413,555	24	52	3	54	89		1	1	121
South Dakota	7	69,190	1	12,500	12	203,250		43	5	13	48	5	4	4	127
Tennessee	118	1,091,305	2	260,000	31	872,110	2	18	2	97	117		12	12	67
Texas	325	4,186,991	1	1,100	345	5,659,252	17	457	14	313	729	25	11	805	57
Utah	39	845,350	1	53,000	35	812,220	11	7	15	23	39	1	3	1	22
Vermont	37	162,180			30	159,000	1	2	15	13	27	2	5	36	2
Virginia	219	2,191,669	5	261,580	107	2,046,830	8	53	28	87	144	2	13	83	41
Virgin Islands															
Washington	162	1,464,200	5	228,075	65	1,391,335	22	28	31	81	95	2	9	29	74
West Virginia	94	684,835	1	1,700	39	426,690	8	32	1	29	77		8	38	31
Wisconsin	187	1,296,020	2	1,985	70	2,175,760	4	33	31	324	323	2	15	83	41
Wyoming	4	27,345			8	122,035	9	6	2	7	11		11	3	65
Major Drainage Basins															
Northeast	723	14,832,615	7	869,600	505	10,162,490	91	153	79	402	284	17	169	559	129
North Atlantic	622	7,901,261	9	349,680	244	11,626,970	29	132	56	240	367	8	97	183	145
Southeast	781	6,687,436	11	689,635	441	6,159,060	118	305	81	612	897	1	33	264	654
Tennessee River	102	992,175			45	889,370	9	20	7	80	110		8	25	53
Ohio River	707	8,821,095	30	1,934,965	446	9,325,385	35	238	70	455	679	38	109	266	373
Lake Erie	147	2,740,194	19	1,602,850	89	3,092,995	2	26	13	74	92	4	28	40	97
Upper Mississippi	506	3,498,240	20	4,432,270	369	10,259,360	43	337	92	690	916	47	56	250	611
Western Great Lakes	330	8,805,705	9	411,935	190	8,641,095	23	46	78	242	298	7	48	93	88
Missouri River	64	2,312,510	7	982,750	164	4,423,085	46	246	81	208	471	15	43	191	963
Southwest-Lower Mississippi	177	2,409,520	7	59,300	226	3,830,866	35	319	67	296	633	13	25	301	675
Colorado River	39	902,665			31	943,270	23	13	9	41	54	1		7	119
Western Gulf	311	4,153,276	2	25,800	314	6,498,406	18	380	25	303	674	29	11	706	80
Pacific Northwest	323	2,761,157	5	228,075	153	,,737,700	40	48	55	186	213	5	11	49	195
California	201	13,422,170	11	505,800	60	8,080,645	38	65	24	213	222	10	11	44	208
Great Basin	51	1,020,540	1	53,000	38	933,695	17	18	17	38	58	3	3	6	45
Alaska							4						1	1	5
Hawaii	19	122,740			14	110,340		2		9	5		2	3	7
Puerto Rico	4	274,545			14	308,235	16	16		41	73	1	1	81	9
Virgin Islands															
Total	5,107	80,937,944	138	,2,145,660	3,343	98,022,967	587	2,364	754	4,230	6,046	191	656	3,069	4,456

Table 10. *Percent of census population in sewered communities connected to sewers and raw and treated discharges—by States*

States	1968 population connected in sewered communities, percent of 1960 census population	Percent of connected population sewage discharged							
		Raw				Treated			
		1945	1957	1962	1968	1945	1957	1962	1968
Alabama	112.1	52.0	47.9	17.6	12.6	48.0	52.1	82.4	87.4
Alaska	70.4	(2)	(2)	83.8	81.6	(2)	(2)	16.2	18.4
Arizona	73.6	9.1	4.4	3.7	3.0	90.9	95.6	96.3	97.0
Arkansas	100.6	47.3	40.6	22.0	8.7	52.7	59.4	78.0	91.3
California	154.3	26.5	2.3	.5	.1	73.5	97.7	99.5	99.9
Colorado	168.1	14.4	5.9	1.6	.3	85.6	94.1	98.4	99.7
Connecticut	74.6	23.9	7.8	3.5	1.7	76.1	92.2	96.5	98.3
Delaware	231.1	81.4	8.0	1.6	.....	18.6	92.0	98.4	100.0
District of Columbia	(1)								
Florida	107.1	53.5	25.9	2.9	2.2	46.5	74.1	97.1	97.8
Georgia	118.6	40.3	39.5	24.1	8.4	59.7	60.5	75.9	91.6
Hawaii	118.1	(2)	(2)	83.4	73.3	(2)	(2)	16.6	26.7
Idaho	107.8	76.2	53.2	13.8	4.1	23.8	46.8	86.2	95.9
Illinois	109.5	6.7	5.0	3.0	1.9	93.3	95.0	97.0	98.1
Indiana	125.1	29.3	16.4	9.4	3.1	70.7	83.6	90.6	96.9
Iowa	92.0	31.2	28.3	17.4	1.1	68.8	71.7	82.6	98.9
Kansas	128.6	30.0	20.3	10.6	12.2	70.0	79.7	89.4	87.8
Kentucky	107.4	73.1	12.6	8.2	.9	26.9	87.4	91.8	99.1
Louisiana	129.0	79.5	73.0	60.6	40.0	20.5	27.0	39.4	60.0
Maine	80.5	97.7	89.1	90.8	60.5	2.3	10.9	9.2	32.5
Maryland	(1)								
Massachusetts	78.3	38.3	29.2	13.0	22.5	61.7	70.8	89.0	77.5
Michigan	114.4	18.7	14.3	1.0	1.4	81.3	85.7	99.0	98.6
Minnesota	99.3	12.9	7.7	3.1	1.1	87.1	92.3	96.9	98.9
Mississippi	107.4	74.8	67.3	54.6	29.6	25.2	32.7	45.4	70.4
Missouri	105.1	81.0	73.0	65.5	36.4	19.0	27.0	34.5	63.6
Montana	107.5	71.2	55.0	6.0	.1	28.8	45.0	94.0	99.9
Nebraska	87.8	53.8	51.8	40.5	2.6	46.2	48.2	59.5	97.4
Nevada	305.1	4.0	5.1	2.1	.3	96.0	94.9	97.9	99.7
New Hampshire	63.5	89.9	81.2	79.0	55.8	10.1	18.8	21.0	44.2
New Jersey	106.6	21.8	2.3	1.2	.....	78.2	97.7	98.8	100.0
New Mexico	107.6	.5	.2	.2	.....	99.5	99.8	99.8	100.0
New York	106.6	37.6	29.3	15.0	10.6	62.4	70.7	85.0	89.4
North Carolina	109.5	35.5	30.1	25.8	6.7	64.5	69.9	74.2	93.3
North Dakota	102.9	16.7	20.3	15.7	2.1	83.3	79.7	84.3	97.9
Ohio	114.9	33.0	17.8	5.3	1.5	67.0	82.2	94.7	98.5
Oklahoma	101.2	21.7	4.4	.6	.2	78.3	95.6	99.4	99.8
Oregon	121.8	81.6	8.1	6.5	3.2	18.4	91.9	93.5	96.8
Pennsylvania	111.4	72.9	42.0	12.2	9.1	27.1	58.0	87.8	90.9
Puerto Rico	83.4	(2)	(2)	21.9	13.4	(2)	(2)	78.1	86.6
Rhode Island	74.2	18.1	.7	.7	.7	81.9	99.3	99.3	99.3
South Carolina	102.8	41.9	41.2	33.5	26.9	58.1	58.8	66.5	73.1
South Dakota	102.4	18.1	15.3	12.2	3.8	81.9	84.7	87.8	96.2
Tennessee	116.5	82.4	54.2	39.2	26.6	17.6	45.8	60.8	73.4
Texas	115.3	8.0	2.0	.6		92.0	98.0	99.4	100.0
Utah	145.5	86.8	59.5	33.1	1.4	13.2	40.5	66.9	98.6
Vermont	80.5	94.8	78.1	59.8	21.7	5.2	21.9	40.2	78.3
Virginia	105.2	72.1	34.3	4.4	.8	27.9	65.7	95.6	99.2
Virgin Islands	157.3	(2)	(2)	(2)	100.0	(2)	(2)	(2)	(2)
Washington	163.4	79.3	57.6	32.8	3.6	20.7	42.4	67.2	96.4
West Virginia	103.6	89.6	75.3	59.5	15.5	10.4	24.7	40.5	84.5
Wisconsin	101.2	8.7	3.9	.3	.....	91.3	96.1	99.7	100.0
Wyoming	111.1	63.9	36.0	4.2	.3	36.1	64.0	95.8	99.7
Total	113.2	37.3	22.3	12.4	6.8	62.7	77.7	87.6	93.2

[1] These percentages are not shown, since they are unrealistic due to the effect of the Washington Suburban Sanitary Commission discharging to the District of Columbia plant.
[2] Percentage figures not available for these years.

Table 11. *Population served by sewers and sewage treatment—by geographical areas*

Geographic areas	1960 census population of sewered communities	Estimated population connected to sewers	Percent of census population connected to sewers	Percent of national total population connected to sewers	Percent of connected population—sewage discharged	
					Treated	Raw
New England [1]	8,976,318	6,918,405	77.1	4.9	79.0	21.0
Middle Atlantic [2]	28,823,298	31,169,141	108.1	22.2	91.9	8.1
South Atlantic [3]	13,167,414	15,106,991	114.7	10.8	94.6	5.4
East North Central [4]	26,136,577	29,475,169	112.8	21.0	98.4	1.6
East South Central [5]	5,660,886	6,315,150	111.6	4.5	83.0	17.0
West North Central [6]	10,237,528	10,316,560	100.8	7.4	86.1	13.9
West South Central [7]	11,618,812	13,282,715	114.3	9.5	92.4	7.6
Mountain [8]	4,624,927	6,242,973	135.0	4.5	99.1	.9
Pacific [9]	13,075,283	19,979,347	152.8	14.2	99.4	.6
Alaska, Hawaii, Puerto Rico and Virgin Islands	1,522,064	1,419,598	93.3	1.0	60.6	39.4
Total	123,843,107	140,226,049	113.2	100.0	93.2	6.8

[1] Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.
[2] New York, New Jersey, Pennsylvania.
[3] Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida.
[4] Ohio, Indiana, Illinois, Michigan, Wisconsin.
[5] Kentucky, Tennessee, Alabama, Mississippi.
[6] Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas.
[7] Arkansas, Louisiana, Oklahoma, Texas.
[8] Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada.
[9] Washington, Oregon, California.

Table 12. *Percentage data for sewer systems and raw and treated discharge—by drainage basins*

Major drainage basins	Percent of U.S. total communities	Percent of census population connected to sewers	Percent of national total population connected to sewers	Percent of connected population—sewage discharged		Percent of total communities discharging		
				Raw	Treated	Raw	Treated	Both raw and treated
Northeast	10.1	96.6	18.6	11.6	88.4	25.5	73.2	1.3
North Atlantic	7.6	119.1	10.1	4.7	95.3	15.3	84.5	.2
Southeast	9.0	108.8	7.6	9.7	90.3	10.0	87.9	2.2
Tennessee River	1.3	132.3	1.0	2.3	97.7	13.5	84.2	2.3
Ohio River	12.2	111.8	9.2	4.5	95.5	20.3	79.5	.3
Lake Erie	1.8	118.0	3.0	1.9	98.1	19.5	80.1	.4
Upper Mississippi	15.2	100.8	9.8	8.9	91.1	5.8	94.0	.2
Western Great Lakes	4.6	113.2	7.0	1.0	99.0	8.6	91.4	.....
Missouri River	12.2	126.3	4.8	5.6	94.4	6.9	93.1	.....
Southwest-Lower Mississippi	9.7	111.9	5.7	20.8	79.2	4.7	94.6	.6
Colorado River	1.4	99.5	.9	2.7	97.3	7.1	92.4	.5
Western Gulf	5.0	119.4	5.9	<.1	100.0	.2	99.8	.....
Pacific Northwest	3.8	126.3	2.5	3.3	96.7	6.3	93.3	.4
California	4.0	154.4	11.9	.1	99.9	1.0	98.6	.4
Great Basin	1.1	156.6	.9	.5	99.5	7.9	91.4	.7
Alaska	.2	70.4	<.1	81.6	18.4	75.0	20.8	4.2
Hawaii	.1	118.1	.4	73.3	26.7	31.6	63.2	5.3
Puerto Rico	.6	83.4	.6	13.4	86.6	9.0	91.0	.....
Virgin Islands	<.1	157.3	<.1	100.0	.....	100.0	.....	.....
Total	100.0	113.2	100.0	6.8	93.2	11.0	88.5	.6

Table 13. *Percentage data for sewer systems and raw and treated discharge—by population groups*

Population size groups	Percent of total number of sewered communities	Percent of 1960 census population of sewered communities	Percent of total population connected—				Percent of total number of treatment plants
			To sewer systems	To raw discharge or treatment facilities [1]	To raw sewage discharge facilities	To sewage treatment facilities	
Under 500	13.9	.5	.5	.5	.8	.5	13.7
500–1,000	17.5	1.4	1.4	1.3	2.4	1.2	16.4
1,000–5,000	41.6	10.2	9.6	8.8	12.5	8.6	39.7
5,000–10,000	11.7	8.6	7.9	6.8	7.1	6.8	11.4
10,000–25,000	9.3	14.8	13.8	11.1	10.9	11.1	9.3
25,000–50,000	3.3	11.7	11.3	9.1	6.7	9.2	3.8
50,000–100,000	1.6	11.3	11.5	9.6	7.8	9.7	2.1
100,000–250,000	.7	9.8	9.7	10.6	14.1	10.3	1.8
250,000–500,000	.3	10.4	11.4	9.7	17.0	9.2	1.2
Over 500,000	.2	21.3	22.7	32.6	20.7	33.4	.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Population served by facilities in population size groups shown.

Table 14. *Percent of census population connected to sewers and population discharging raw or treated sewage within population groups*

Population size groups	Percent of census population in sewered communities connected to sewers				Percent of connected population in discharging							
					Raw				Treated			
	1945	1957	1962	1968	1945	1957	1962	1968	1945	1957	1962	1968
Under 500	92.7	112.1	102.5	128.4	35.7	25.5	17.6	10.4	64.3	74.5	82.4	89.6
500–1,000	77.1	90.1	93.4	113.8	35.5	29.2	23.3	12.5	64.3	70.8	76.7	87.5
1,000–5,000	77.6	82.5	91.1	106.7	39.1	29.1	20.1	9.6	60.8	70.9	79.9	90.4
5,000–10,000	83.4	96.5	85.5	104.5	42.0	23.8	16.9	7.1	58.0	76.2	83.1	92.9
10,000–25,000	88.0	101.3	91.6	105.2	43.7	24.4	13.5	6.7	56.3	75.6	86.5	93.3
25,000–50,000	95.7	100.7	93.1	109.3	41.8	26.0	10.7	5.0	58.2	74.0	89.3	95.0
50,000–100,000	96.7	101.4	98.1	115.4	45.7	25.4	15.2	5.6	54.3	74.6	84.8	94.4
100,000–250,000	95.3	96.9	100.6	112.7	33.0	19.1	10.1	9.0	67.0	80.9	89.8	91.0
250,000–500,000				123.9				11.9				88.1
500,000 and over				121.1				4.3				95.7
Total	91.1	96.4	95.9	113.2	37.3	22.3	12.4	6.8	62.7	77.7	89.6	93.2

Table 15. *Comparative data for 1940–68 for sewage disposal systems*

	1940	1945	1948	1949	1957	1962	1968
Number of sewered communities	8,516	8,917	(*)	(*)	11,131	11,420	12,911
Census population, mil.	[1] 75.7	[1] 82.0	(*)	(*)	[2] 102.0	[1] 123.4	[8] 123.8
Estimated population connected, mil.	70.5	[7] 74.7	76.7	78.9	98.4	118.3	140.2
Percent of census population connected	93.1	91.1	.....	.....	96.4	95.9	113.2
Raw discharge:							
Number of communities	[3] 3,597	[4] 3,610	[5] 3,800	[5] 3,718	[6] 3,165	[9] 2,249	[10] 1,489
Estimated population served, mil.	29.9	27.8	28.0	28.1	21.9	14.7	9.5
Percent of total sewered population	42.4	37.3	36.5	35.6	22.3	12.4	6.8
Treated discharge:							
Number of communities	[3] 5,085	[4] 5,480	(*)	(*)	[6] 8,066	[9] 9,281	[10] 11,422
Estimated population served, mil.	40.6	46.9	48.7	50.8	76.4	103.7	130.7
Percent of total sewered population	57.6	62.7	63.5	64.4	77.7	87.6	93.2

*Data are not available.
[1] 1940 census data.
[2] 1950 census data.
[3] Includes 166 communities discharging both raw and treated sewage.
[4] Includes 173 communities discharging both raw and treated sewage.
[5] Includes communities where only part of sewage is discharged untreated.
[6] Includes 100 communities discharging both raw and treated sewage.
[7] Includes 7,990 population discharging through semipublic facilities and not included in discharge data.
[8] 1960 census data.
[9] Includes 110 communities discharging both raw and treated sewage.
[10] Includes 73 communities discharging both raw and treated sewage.

Table 16. *Sewage discharge to watercourses in 1940, 1945, 1957, 1962, and 1968*

Treatment	Derived percent reduction 1962	Estimated population equivalent discharged (1,000's)				
		1940	1945	1957	1962	1968
None	0.0	37,372	34,835	27,398	18,698	11,927
Minor	22.0	3,288	4,270	1,860	2,352	1,198
Primary	39.4	10,396	11,798	17,633	22,994	22,021
Intermediate	50.0	2,201	2,051	3,047	4,953	2,929
Secondary	81.1	3,178	3,790	7,582	15,206	16,248
Total	.....	56,435	56,744	57,520	64,203	54,323

Table 17. *Development of sewer systems in the United States*

Year	Total U.S. population—millions	Sewage facility development	
		Number of sewered communities	Population served by sewers (millions)
1860 [1]	31.4	10	1.0
1870	38.6	100	4.5
1880	50.2	200	9.5
1890	62.9	450	16.1
1900	76.0	950	24.5
1910	92.0	1,600	34.5
1920	105.7	3,000	47.5
1930	122.8	5,100	61.5
1935	127.2	6,800	69.5
1940 [2]	132.7	8,516	70.5
1945 [3]	139.6	8,917	74.7
1948 [4]	[5] 144.6	[6]	76.7
1949 [4]	[5] 149.2	[6]	78.9
1957	[5] 171.2	11,131	98.4
1962	[5] 185.8	11,420	118.4
1968	[7] 196.8	12,911	140.2

[1] Data for 1960 to 1935, inclusive from Hyde, C. G.: Modern Sewage Disposal. Federation of Sewage Disposal Works Associations, 1938, pp. 1–14.
[2] Data for 1940 from (2). "Number of communities corrected from 8,518."
[3] Data for 1945 from (3).
[4] Data for 1948 and 1949 from unpublished U.S. Public Health Service data.
[5] July 1, 1962 data, estimated by Census Bureau, Current Population Reports, Series P–25.
[6] Not available.
[7] Jan. 1, 1968 data estimated by census, etc.

Table 18. *Percent of total sewered communities and connected population by population groups*

Population size groups	Communities sewered (accumulated percent of total)				Estimated connected population (accumulated percent of total)			
	1945	1957	1962	1968	1945	1957	1962	1968
Under 500	8.8	11.3	11.0	13.9	0.3	0.4	0.3	0.5
500–1,000	27.6	28.9	27.0	31.4	1.6	1.7	1.4	1.9
1,000–5,000	76.3	75.7	70.9	73.3	11.9	12.6	10.4	11.5
5,000–10,000	87.6	87.1	83.2	84.7	19.7	21.2	17.6	19.4
10,000–25,000	95.3	95.1	93.4	94.0	31.9	35.1	31.3	33.2
25,000–50,000	97.7	97.8	97.0	97.0	41.6	45.6	42.8	44.5
50,000–100,000	98.9	99.0	98.8	98.9	51.2	55.3	54.2	56.1
100,000–250,000	100.0	100.0	100.0	99.5	100.0	100.0	100.0	65.8
250,000–500,000				99.8				77.2
500,000 and over				100.0				100.0

Table 19. *Percent of sewered population served by or serving others, by population size groups*

Population size groups	Percent of sewered population served by other facilities				Percent of population served contributed by others			
	1945	1957	1962	1968	1945	1957	1962	1968
Under 500	7.6	12.8	8.4	4.5	2.5	0.2	0.9	0.3
500–1,000	3.7	6.9	6.8	5.6	.3	.6	2.8	1.4
1,000–5,000	6.2	11.9	10.3	9.8	1.9	1.9	2.6	1.7
5,000–10,000	10.9	16.3	18.8	18.5	2.5	2.8	9.9	5.1
10,000–25,000	14.0	22.9	25.5	26.0	2.7	5.1	6.7	7.9
25,000–50,000	20.9	27.7	31.4	27.0	6.3	7.6	8.8	8.6
50,000–100,000	17.6	25.1	35.7	28.9	11.2	15.2	15.0	14.3
100,000–250,000	19.2	20.4	20.0	15.5	26.4	33.0	34.1	22.3
250,000–500,000				26.7				13.8
Over 500,000				20.1				44.2
Total	16.3	20.4	22.6	21.6	16.3	20.4	22.6	21.6

Note: Basic data from table 4.

Table 20. *Percent of each type of sewer within population groups*

Population size groups	*Percent of communities with—		
	Separate sewers	Combined sewers	Both separate and combined sewers
Under 500	95.5	3.5	1.0
500–1,000	90.2	7.6	2.2
1,000–5,000	85.5	10.3	4.3
5,000–10,000	81.0	10.4	8.6
10,000–25,000	78.3	13.2	8.5
25,000–50,000	71.3	13.9	14.8
50,000–100,000	65.8	22.4	11.7
100,000–250,000	52.4	22.6	25.0
250,000–500,000	58.3	19.4	19.4
Over 500,000	27.3	31.8	40.9
Total	85.2	9.7	5.1

*Percent of reported cases.

Table 21. *Sewage treatment data—1940 to 1962*

NUMBER OF PLANTS

Degree of treatment	1940	1945	1948	1949	1957	1962	1968	Percent increase [2]			
								1945–68	1949–68	1957–68	1962–68
Minor	49	60	51	54	41	37	47	(21.7)	(13.0)	14.6	27.0
Primary	2,889	2,829	2,984	3,019	2,730	2,672	2,384	(15.7)	(21.0)	(12.7)	(11.1)
Intermediate		98	106	107	100	85	75	(23.5)	(29.9)	(25.0)	(11.8)
Secondary	2,630	2,799	2,917	3,050	4,647	6,584	9,951	255.5	226.3	114.1	51.1
Total	[1] 5,580	5,786	6,058	6,230	7,518	9,378	[4] 12,565	117.2	101.7	67.1	34.0

ESTIMATED POPULATION SERVED—1,000's

Minor	3,288	4,270	4,019	3,851	1,860	2,351	1,361	(68.1)	(64.7)	(26.8)	(42.1)
Primary	15,133	17,173	18,393	17,218	25,667	32,734	36,947	115.3	114.6	43.9	12.9
Intermediate		3,763	3,595	3,625	5,591	7,409	5,858	55.7	61.6	4.7	(20.9)
Secondary	22,171	21,659	22,691	26,090	43,326	61,191	85,641	295.4	224.4	100.0	40.0
Total	[3] 40,617	46,865	48,698	50,784	76,444	103,685	[4] 130,685	178.9	157.3	71.0	27.3

[1] Includes 12 plants—unknown treatment.
[2] Includes 25,000—unknown treatment.
[3] ( ) denotes decrease.
[4] Includes 10 tertiary and 98 unknown treatment.

Table 22. *Number of plants and population served by degree of treatment—Percent of total within each population size groups*

Population size groups	Total*		Minor		Primary		Intermediate		Secondary	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Under 500	100.0	100.0	<.1	<.1	14.8	21.9	.....	.....	85.2	78.1
500–1,000	100.0	100.0	.3	.3	17.4	22.5	.1	.1	82.1	77.1
1,000–5,000	100.0	100.0	.4	.4	19.9	21.0	.3	.4	79.4	78.2
5,000–10,000	100.0	100.0	.5	.3	20.1	20.4	.8	1.2	78.6	78.0
10,000–25,000	100.0	100.0	.3	.2	21.7	24.6	1.8	2.3	76.2	73.0
25,000–50,000	100.0	100.0	.2	.3	23.9	25.2	1.7	2.6	74.1	71.8
50,000–100,000	100.0	100.0	.8	.9	20.3	28.7	2.6	4.5	76.3	65.9
100,000–250,000	100.0	100.0	1.3	2.5	24.9	39.7	1.3	2.9	72.4	55.0
250,000–500,000	100.0	100.0	.....	.....	12.8	28.9	1.3	7.6	85.9	63.5
Over 500,000	100.0	100.0	4.1	1.8	20.5	30.9	9.6	7.3	65.8	59.9
Total*	100.0	100.0	.4	1.0	19.1	28.5	.6	4.5	79.9	66.0

*Does not include 10 tertiary plants and 98 for which degree of treatment was not given.

Table 23. *Number of plants and population served by degree of treatment—percent of total within each major drainage basin*

Major drainage basins	Total*		Minor		Primary		Intermediate		Secondary	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Northeast	100.0	100.0	1.5	5.4	48.0	38.9	1.5	3.1	49.0	52.6
North Atlantic	100.0	100.0	.4	.1	27.6	17.1	1.1	17.7	70.9	65.2
Southeast	100.0	100.0	.6	.8	20.9	23.3	.1	<.1	78.4	75.9
Tennessee River	100.0	100.0			29.1	34.3			70.9	65.7
Ohio River	100.0	100.0	.2	<.1	22.4	29.0	1.9	11.4	75.5	59.5
Lake Erie	100.0	100.0			7.6	11.8	6.2	9.0	86.2	79.2
Upper Mississippi	100.0	100.0	.7	.1	12.3	12.1	.2	.5	86.7	87.3
Western Great Lakes	100.0	100.0	.4	<.1	34.2	51.7	.6	.8	64.8	47.5
Missouri River	100.0	100.0			10.4	25.5	.2	9.8	89.4	64.8
Southwest-Lower Mississippi	100.0	100.0			7.9	12.8			92.1	87.2
Colorado River	100.0	100.0			13.1	2.1			86.9	97.9
Western Gulf	100.0	100.0	.1	<.1	6.6	1.1			93.3	98.9
Pacific Northwest	100.0	100.0	.2	.1	30.3	50.8	.2	.3	69.3	48.7
California	100.0	100.0			17.9	46.8	.4	1.4	81.7	51.8
Great Basin	100.0	100.0			16.4	3.6	.9	.4	82.8	96.0
Alaska	100.0	100.0			83.3	97.4			16.7	3.5
Hawaii	100.0	100.0	4.8	7.5	28.6	29.3			66.7	63.2
Puerto Rico					40.9	53.8			59.1	46.2
Virgin Island										
Total*	100.0	100.0	.4	1.0	19.1	28.5	.6	4.5	79.9	66.0

* Does not include 10 tertiary plants and 98 for which degree of treatment was not given.

Table 24. *Primary treatment—percent of types of plants and population served within population groups*

Population size groups	Total		Septic tanks		Imhoff tanks		Mechanically cleaned tanks		Plain hopper bottom tanks		Tank with no detail		Others and unknown	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Under 500	100.0	100.0	38.3	17.9	49.0	28.9	9.1	44.4	1.2	1.1	.8	.4	1.6	7.3
500–1,000	100.0	100.0	22.5	31.3	51.4	36.6	18.8	19.9	3.1	3.6	1.7	4.1	2.5	4.6
1,000–5,000	100.0	100.0	15.1	12.2	42.0	33.4	35.8	44.8	2.8	2.7	1.2	3.3	3.2	3.5
5,000–10,000	100.0	100.0	6.3	2.9	13.6	9.7	67.2	74.5	1.4	1.4	2.8	3.2	8.7	8.4
10,000–25,000	100.0	100.0	5.6	2.2	12.7	7.8	70.5	84.4	1.6	.4	.4	.5	9.2	4.7
25,000–50,000	100.0	100.0	4.5	.6	8.0	2.6	81.3	91.4	.9	.....	1.8	3.2	3.6	2.1
50,000–100,000	100.0	100.0	1.9	.....	3.7	.1	87.0	88.7	3.7	9.4	3.7	1.7	.....	.....
100,000–250,000	100.0	100.0	.....	.....	14.3	2.6	78.6	96.9	.....	.....	1.8	.2	5.4	.3
250,000–500,000	100.0	100.0	.....	.....	21.1	10.9	73.7	78.1	.....	.....	.....	.....	5.3	10.9
Over 500,000	100.0	100.0	.....	.....	6.7	2.2	80.0	89.6	6.7	8.1	.....	.....	6.7	.....
Total	100.0	100.0	15.2	1.5	34.1	6.2	42.7	84.7	2.2	4.2	1.4	.9	4.2	2.4

Table 25. *Primary treatment—percent of types of plants and population served within drainage basins*

Major drainage basins	Total		Septic tanks		Imhoff tanks		Mechanically cleaned tanks		Plain hopper bottom tanks		Tanks with No detail		Others and unknown	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Northeast	100.0	100.0	14.6	2.3	24.9	9.6	47.6	68.1	2.5	15.3	2.5	2.2	7.9	2.5
North Atlantic	100.0	100.0	10.0	1.6	35.5	8.9	38.0	85.1	1.5	.3	3.5	.9	11.5	3.1
Southeast	100.0	100.0	24.0	3.0	45.5	7.3	26.8	88.3	2.0	.3	.3	.....	1.4	1.1
Tennessee River	100.0	100.0	14.0	2.4	30.0	4.8	46.0	91.7	6.0	.8	2.0	.2	2.0	.2
Ohio River	100.0	100.0	7.1	1.3	39.4	8.1	45.0	85.1	2.5	3.3	2.1	1.3	3.9	.8
Lake Erie	100.0	100.0	11.8	.1	41.2	68.3	41.2	30.0	.....	.....	.....	.....	5.9	1.6
Upper Mississippi	100.0	100.0	7.7	.9	29.4	3.9	55.7	92.8	4.1	.7	.5	.....	2.7	1.7
Western Great Lakes	100.0	100.0	9.0	.2	17.5	1.2	71.1	98.5	.....	.....	.6	.....	1.8	.....
Missouri River	100.0	100.0	10.4	.5	50.9	3.9	34.4	95.0	3.1	.4	.....	.....	1.2	.2
Southwest-Lower Mississippi	100.0	100.0	24.1	2.5	47.2	7.1	26.9	90.1	1.9	.3	.....	.....	.....	.....
Colorado River	100.0	100.0	56.5	37.9	21.7	9.5	17.4	51.0	4.3	1.5	.....	.....	.....	.....
Western Gulf	100.0	100.0	12.5	4.7	73.2	66.8	8.9	19.1	5.4	9.4	.....	.....	.....	.....
Pacific Northwest	100.0	100.0	18.1	1.0	22.2	1.8	54.9	73.1	.7	.3	.....	.....	4.2	23.8
California	100.0	100.0	16.9	.1	11.2	.2	59.6	98.0	1.1	.1	6.7	.9	4.5	.6
Great Basin	100.0	100.0	42.1	11.0	36.8	42.3	21.1	46.7	.....	.....	.....	.....	.....	.....
Alaska	100.0	100.0	80.0	10.0	.....	.....	.....	.....	.....	.....	.....	.....	20.0	90.0
Hawaii	100.0	100.0	.....	.....	.....	.....	50.0	19.3	.....	.....	.....	.....	50.0	80.7
Puerto Rico	100.0	100.0	44.4	25.8	41.7	15.5	13.9	58.8	.....	.....	.....	.....	.....	.....
Virgin Islands	100.0	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	100.0	100.0	15.2	1.5	34.1	6.2	42.7	84.7	2.2	4.2	1.4	.9	4.2	2.4

Table 26. *Secondary treatment—percent of types of plants and population served within population groups*

Population size groups	Total		Activated sludge		Extended aeration		Trickling filter standard rate		Trickling filter high rate		Intermittent sand filter		Application to land		Stabilization ponds		Others and unknown	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
Under 500	100.0	100.0	7.8	8.8	10.1	10.1	9.3	10.7	3.6	4.7	4.0	5.5	2.5	2.2	61.5	56.6	1.2	1.5
500–1,000	100.0	100.0	8.3	9.1	9.2	9.3	19.2	19.4	8.1	9.5	3.6	2.9	1.9	1.9	48.7	46.7	1.0	1.1
1,000–5,000	100.0	100.0	11.1	13.2	8.0	6.8	23.8	25.6	18.1	22.8	1.7	1.3	1.0	1.0	34.0	26.8	2.2	2.5
5,000–10,000	100.0	100.0	15.8	19.1	5.8	3.1	27.4	28.9	27.9	30.7	2.6	.7	.7	.8	16.0	13.1	3.8	3.6
10,000–25,000	100.0	100.0	18.7	25.9	4.6	1.4	24.0	24.8	32.2	34.6	2.5	1.0	.6	.5	15.0	9.5	2.4	2.3
25,000–50,000	100.0	100.0	29.4	34.2	9.5	3.4	15.3	15.8	29.7	36.1	2.0	.....	.6	1.0	10.4	5.2	3.2	4.4
50,000–100,000	100.0	100.0	33.0	51.3	4.9	1.9	12.3	14.4	32.0	24.1	1.0	.....	1.5	1.2	13.3	3.9	2.0	3.3
100,000–250,000	100.0	100.0	31.3	59.5	12.9	.4	8.6	9.4	33.1	22.4	.6	.....	.6	.....	9.8	2.9	3.1	5.4
250,000–500,000	100.0	100.0	24.2	43.7	10.2	11.5	13.3	21.3	32.0	11.3	.....	.....	.....	.....	11.7	.8	8.6	11.4
Over 500,000	100.0	100.0	54.2	70.4	2.1	.9	10.4	.1	8.3	3.8	.....	.....	.....	.....	8.3	.1	16.7	24.7
Total	100.0	100.0	13.2	45.0	8.0	3.2	20.3	14.0	17.7	19.2	.25	.4	1.3	.5	34.7	7.1	2.3	10.6

Table 27. *Secondary treatment—percent of types of plants and population served within drainage basins*

Major drainage basins	Total		Activated sludge		Extended aeration		Trickling filter standard rate		Trickling filter high rate		Intermittent sand filter		Application to land		Stabilization ponds		Others and unknown	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
Northeast	100.0	100.0	15.8	57.7	18.2	4.9	17.4	5.1	25.5	10.9	13.8	1.0	.7	.....	3.1	.3	5.5	20.1
North Atlantic	100.0	100.0	20.9	67.8	7.6	1.6	24.2	11.0	19.3	13.9	3.5	.4	.6	.4	14.2	1.4	9.8	3.5
Southeast	100.0	100.0	12.0	26.4	9.6	2.1	10.1	13.0	31.8	40.0	2.6	.5	.2	.....	32.9	11.0	.7	7.0
Tennessee River	100.0	100.0	12.3	38.8	17.2	3.4	27.9	20.5	17.2	16.1	.8	.1	.8	.1	19.7	3.9	4.1	17.2
Ohio River	100.0	100.0	18.0	39.6	29.6	17.7	22.0	18.4	16.3	12.1	2.2	.5	.3	.....	8.1	1.5	3.4	10.2
Lake Erie	100.0	100.0	27.8	89.3	42.3	4.0	13.9	3.6	6.2	2.0	1.0	.1	.....	.....	7.2	.9	1.5	.2
Upper Mississippi	100.0	100.0	13.7	57.8	1.7	.6	31.5	17.1	14.7	8.5	2.9	.2	.5	.1	33.4	5.3	1.6	10.4
Western Great Lakes	100.0	100.0	39.0	76.7	4.4	.4	20.3	4.3	18.7	10.6	1.6	.4	.....	.....	14.6	1.2	1.3	6.4
Missouri River	100.0	100.0	5.8	34.7	3.8	3.4	18.8	17.2	4.6	16.8	1.7	.3	.8	.5	63.9	26.5	.6	.7
Southwest-Lower Mississippi	100.0	100.0	4.9	17.1	2.9	1.4	24.1	29.1	12.0	31.5	.6	.2	.6	.3	54.2	19.3	.7	1.2
Colorado River	100.0	100.0	3.3	37.4	5.3	.5	11.8	8.4	12.5	36.2	2.0	.1	5.9	.2	58.6	16.7	.7	.5
Western Gulf	100.0	100.0	13.9	28.4	1.0	.1	16.8	13.1	27.3	48.5	2.1	.3	.5	.2	33.7	8.3	4.6	1.2
Pacific Northwest	100.0	100.0	9.1	19.2	1.2	.2	10.6	18.7	31.0	36.8	.3	.....	4.3	1.0	42.6	18.6	.9	5.5
California	100.0	100.0	22.2	27.0	2.0	.4	16.7	13.8	10.6	8.2	.7	.....	11.8	3.3	33.7	9.4	2.2	37.9
Great Basin	100.0	100.0	5.2	11.1	2.1	.5	38.5	65.9	5.2	3.0	1.0	1.1	13.5	.9	34.4	17.5	.....	.....
Alaska	100.0	100.0	100.0	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hawaii	100.0	100.0	7.1	11.7	50.0	10.7	7.1	29.8	21.4	45.2	.....	.....	.....	.....	7.1	.2	7.1	2.4
Puerto Rico	100.0	100.0	15.4	6.0	.....	.....	.....	.....	84.6	94.0	.....	.....	.....	.....	.....	.....	.....	.....
Virgin Islands	100.0	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	100.0	100.0	13.2	45.0	8.0	3.2	20.3	14.0	17.7	19.2	2.5	.4	1.3	.5	34.7	7.1	2.3	10.6

Table 28. *Intermediate and secondary treatment processes—comparative data for 1940, 1945, 1957, 1962, and 1968*

Type of treatment	Number of plants					Estimated population served (millions)				
	1940	1945	1957	1962	1968	1940	1945	1957	1962	1968
Chemical treatment	185	197	255	26	28	4.0	5.3	7.3	1.3	.5
Activated sludge	302	324	603	774	1,270	10.5	11.6	25.0	31.1	38.6
Trickling filter standard rate	1,486	1,459	1,964	2,203	2,083	8.4	8.8	11.3	14.6	13.8
Trickling filter high rate		122	860	1,398	1,523		.7	6.5	12.3	18.7
Intermittent sand filter	432	448	398	351	316	.9	1.0	.9	.6	1.0
Application to land	304	422	461	401	512	.9	1.3	2.0	2.7	4.9
Stabilization ponds	(*)	45	631	1,655	3837	(*)	.2	2.4	4.3	9.1
Extended aeration	(*)	(*)	(*)	156	826	(*)	(*)	(*)	.4	2.6

*Not available.

Table 29. *Plants providing chlorination and grit removal by population groups*

Population size groups	Percent of plants providing—							
	Chlorination				Grit removal			
	1945	1957	1962	1968	1945	1957	1962	1968
Under 500	15.1	18.1	18.7	18.7	2.3	1.9	3.4	3.2
500–1,000	15.4	18.6	22.2	26.7	3.9	5.6	7.8	7.6
1,000–5,000	19.7	26.6	31.9	38.1	9.5	16.0	22.2	24.0
5,000–10,000	29.8	39.4	49.4	57.1	22.9	36.4	42.5	45.0
10,000–25,000	36.5	49.1	55.9	59.7	32.5	49.7	53.3	52.2
25,000–50,000	33.3	63.8	62.8	67.2	36.9	66.8	63.9	59.6
50,000–100,000	32.4	54.5	66.9	69.5	52.1	76.8	68.0	62.1
100,000–250,000	37.7	54.9	66.4	73.9	52.5	72.0	50.0	55.2
250,000–500,000				65.1				34.9
Over 500,000				58.9				69.9
Total	21.8	29.5	36.8	40.6	13.2	21.0	27.1	26.6

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